THE IRON AGE

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To Prepare Soldier Cripples for Industry

Outline of Government Plans to Reinstate the Maimed of War on a Self-Sustaining Basis

PROGRESS in the matter of caring for crippled soldiers, to prepare them for taking a definite place in the work of the world after the war, is being made under the auspices of the United States Army. Early this year scientists and sociologists who had seen much of the results of the war contended that the subject could not be given consideration too soon. Yet it seemed that nothing was being done, so all-absorbing have been the large immediate questions of other phases of war planning. The economic and industrial, as well as the human, problems of rebuilding cripples are admittedly important. With any long participation by our representatives on the fighting fronts these problems will be big, for with the great strides made by modern surgery in saving lives proportionately large are the numbers of those with missing limbs and blinded eyes.

The fear has been that the unfortunates would perhaps be left to make hit-and-miss selections of an occupation. It was thought that they would be taken in hand by self-directed, if albeit kindly disposed, volunteer instructors and turned into producers of articles of low commercial value. Handiwork for which only an artificial demand could be created, and this from charitable impulses, would not long be regarded as any able-bodied man's work; the cripple desires to be put on a fully self-supporting plane. The net result, otherwise, is a lowering of morale and a tendency toward wilful dependency. Though fortunately there are, as yet, no war subjects for surgical and sociological study, it has been urged that the salvaging of our war cripples demands a careful canvassing of all that should be done, which will take long to establish, and the securing of instructors to be educated before they are ready to direct their pupils.

Announcement of Governmental consideration of the problem was made some weeks ago by Major Gen. W. C. Gorgas, surgeon general, U. S. A. The idea that responsibility of the Government ended with the return of the soldier to private life, with his wounds healed, and such pension as he night be given, no longer holds, he said, but instead "It is the duty of the Government to equip and reeducate the wounded man, after healing his wounds, and to return him to civil life ready to be as useful to himself and his country as possible."

A Mechanical Arm and Hand Is One of the Devices Developed by Dr. Jules Amar, a French Investigator

He told how the idea was to be carried out. Reconstruction hospitals are to be located in large centers of population, such as Boston, New York, Philadelphia, Baltimore, Washington, Buffalo, Cincinnati, Chicago, St. Paul, Seattle, San Francisco, Los Angeles, Denver, Kansas City, St. Louis, Memphis, Richmond, Atlanta and New Orleans.

These hospitals are not to be the last step in the return of the wounded soldiers to civil life. When the soldiers are able to take up industrial training further provision will be ready.

"Additional education will be given to those fitted for it, and men may in some cases be returned to more valuable work than that from

which they were called to war. Workshops will be provided at the hospitals, but arrangements will also be made with outside industries whereby more elaborate methods of training may be carried on. An employment bureau will be established to place men so trained in different parts of the United States."

The subject was also given special attention at a meeting this week in Chicago of the Clinical Congress of Surgeons. It was brought out that every effort will be made to do the best "repair" work possible on men whose early return to the trenches is out of the question. Expert opticians and optometrists will do all that they can for men partly blind, for instance. Expert psychologists will devote their time to studying the state of mind and point of view of soldiers who have paid their price and to whom things look black. "Their morale will be built up, they will receive new interests, and every opportunity to realize that life is worth the living, the more so that their duty has been well done."

Some conspicuous work on what is known as the reeducation of the maimed has been done by Dr. Jules Amar, director of the Laboratoire des Recherches sur le travail professionnel of the Conservatoire des Arts et Metiers, Paris. At a meeting held on Dec. 23, 1916, he read a paper profusely illustrated with examples of the apparatus he has employed to ascertain the physical strength of disabled members and to increase their usefulness by exercising under special conditions. He showed various artificial attachments for arm and leg, either to ameliorate a paralyzed condition or to substitute for a missing part, such as a forearm, hand or leg. The accompanying illustrations show two cases of mechanical arms with substantially universal joints.

Other illustrations of the numerous applications of mechanical devices originating with Dr. Amar have been shown in general magazines. In a general way they represent an adaptation of the individual to existing conditions and existing industrial apparatus, while a school of investigators in this country, of which Frank B. Gilbreth, industrial engineer, Providence, R. I., is a leader, emphasizes the desirability of modifying possible equipment or devices to suit the limited capabilities of the injured person. A monograph on this subject was presented under the joint authorship of Mr. Gilbreth and Dr. Lillian M. Gilbreth before the Economical Psychology Association early this year. Later these same authors discussed the subject before the national conference of the Western Efficiency Society in Chicago in May, and from this the following items may be taken as summing up the necessity of specially careful working out of the general salvaging program:

A universal lack of realization of the great difference existing among the cripples, and of the need of placing each man in that work not only that he was best fitted to do, but that he would most enjoy doing, and that would arouse and hold his interest most successfully and permanently.

A lack of realization of the many more opportunities available for cripples than had been realized.

A lack of realization of the necessity of supplying the proper and fitting reeducation for the productive output at the earliest possible moment, in order to bridge over the period of discouragement and despondency and to help the cripple to fit back into the economic world and its work.

A failure to impress upon the cripple from the earliest possible moment his likeness to other people and to other workers, rather than his differences, and therefore, as a result, a failure to provide for that social element in the work that is necessary if his permanent happiness is to result.

A failure to educate the general community as to what their attitude toward the cripple should be.

In a paper presented before the tenth Sagamore Sociological Conference in June the same authors discussed some of their experiments with micromotion films and other apparatus which they use, and dwelt on the advantage of experimenting with unmaimed subjects, as these possess to an exaggerated degree the awkwardness which characterizes the recent cripple. They urge every one to try to discover opportunities for the cripple. They consist, they say, of:

1. Of adapting cripples to jobs already existing, or so adapting such jobs to cripples, that cripples may become competitors with the whole worker. 2. Of finding occupations that do not exist, but which should exist for public prosperity, and assigning these to crippled workers. 3. Of reserving certain jobs for cripples and putting them in these jobs on a non-competitive basis so far as uncrippled workers are concerned.

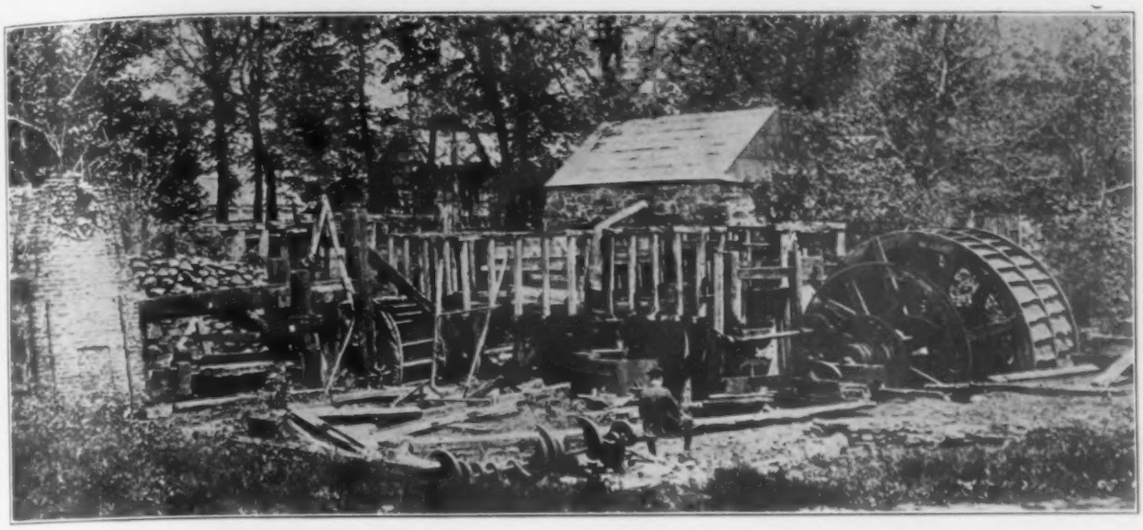
Another of Dr. Amar's Substitutes for Hand and Arm

Will Build Wooden Ships

TORONTO, ONT., Oct. 22.—Thomas Mulvey Kirkwood, Toronto, has been granted favors by the city of Three Rivers, Que., for the construction of wooden ships. Mr. Kirkwood has organized the Three Rivers Shipyard Co., Ltd., whose bonds are financed by Le Credit Canadien, Ltd., Montreal, Que., and guaranteed by the city of Three Rivers. The cost of each vessel will be $450,000. The shipyard will be located on the western side of the Three Rivers harbor, and will cover an area of some five acres. The plant will consist of one 2-story machine and pattern shop, 75 x 175 ft., concrete foundation and wooden frames; two 250-ft. slips on pile foundations, the bottom being clay and sand.

A large deposit of pyrites of iron, for the manufacture of sulphuric acid, has been offered to the Government without charge by the owners, through H. Ward Hicks, Ste. Genevieve, Mo. The deposit is located in and adjoining Ste. Genevieve County.

As early as 1750 the Ryerson family was interested in iron manufacture in New Jersey, where are the remains of old Ryerson forge



A 75TH ANNIVERSARY

Joseph T. Ryerson & Son to Commemorate Establishing of Business in 1842

THE corporation of Joseph T. Ryerson & Son will commemorate, Nov. 1, the seventy-fifth anniversary of its establishment in Chicago. The growth and development of the corporation form a part of the story of the rise of Chicago and the great West and are closely associated with the expansion of the steel industry. In connection with the anniversary, the unusual facts can be pointed out that for 200 years the Ryerson family has been connected with iron and that one branch of the family has carried on this record from father to son for five generations, covering the period since 1750.

Early in the eighteenth century interest was manifested in iron deposits on a tract of 6000 acres in northern New Jersey which were bought by George Ryerson and associates, and from 1750 to 1770 certain crude processes of iron manufacturing were inaugurated, the family, it is stated, subsequently pushing the development of these interests to the extent of making pig iron as early as 1760.

Thomas Ryerson, in 1790, started in business as a wholesale dealer in finished iron and steel products of imported and domestic manufacture, in Philadelphia. His son, Joseph T. Ryerson, located in Chicago and established the present firm of Joseph T. Ryerson & Son, in 1842. His son, Edward L. Ryerson, continued the business, which since 1888 has been a corporation, of which he was president until 1911, and is now chairman of the board of directors. His sons, Joseph T. Ryerson, Donald M. Ryerson and Edward L. Ryerson, Jr., have entered the firm during the past fifteen years and are now vice-presidents.

Chicago Then a City of 6000

In his journey to Chicago, in 1842, Joseph T. Ryerson started from Philadelphia by railroad to Columbia, Pa., and then proceeded as follows: Stage coach over the mountains to Pittsburgh; stage to Cleveland; boat to Detroit; rail to Jackson, Mich.; stage to St. Joseph, Mich., and boat to Chicago. He arrived Nov. 1, after an eight days' journey, and found Chicago a city of 6000 people, with half a dozen brick buildings and the remainder rude frame structures.

After bartering with the agent, who wanted $300 a year, Mr. Ryerson finally, for $200, secured possession of a two-story brick building just west of the southwest corner of Clark and Water streets. Soon he received a stock of $20,000 worth of iron and began business as the accredited agent of Wood, Edwards & McKnight, Pittsburgh iron masters.

The first venture having proved successful, and more space being needed, Mr. Ryerson, in the spring of 1843, rented a larger brick store at 90 Lake Street, just opposite the old Tremont House, a famous Chicago landmark on the corner of Dearborn and Lake streets.

In 1844 he secured land at 74 Lake Street and built a two-story building and stocked it, on his own account, retaining also the stock of heavy iron for his Pittsburgh firm. Several years elapsed and Lake Street developed into a dry goods shopping center, so Mr. Ryerson, in 1852, bought an 80-ft. dock lot at 218-224 South Water Street. Though his friends regarded him as going far out in the prairie, the new location proved ideal, as he could receive all consignments of iron arriving by lake at his own docks.

Rebuilds After Great Fire

His business weathered the panic of 1857 and continued to increase with the growth of the Middle West. On Oct. 9, 1871, the great Chicago fire reduced his building to ashes. The South Water Street warehouse was rebuilt and stock replenished by March 15, 1872. From this time on his business grew rapidly. He purchased a lot at 18-22 Milwaukee Avenue and erected a three-story office and warehouse building, but did not live to see a transfer of the business to the new building, his death occurring March 9, 1885. At the death of Mr. Ryerson, his son, Edward L. Ryerson, who had been admitted to partnership in 1879, succeeded to sole care of the interests of the firm. In this period of the firm's history the business was incorporated under the old name of Joseph T. Ryerson & Son, with Edward L. Ryerson, president; Herman B. Butler, vice-president and treasurer, and Clyde M. Carr, secretary.

The last twenty-five years are a series of expansions, ending in the present plant at Sixteenth and Rockwell streets, Chicago, and also in the erection of branch plants at Jersey City and St. Louis. This year, on the seventy-fifth anniversary of the firm, the fourth unit is being opened at Detroit.

When Edward L. Ryerson retired as president, in 1911, and was elected chairman of the board of directors, Mr. Carr succeeded him as president. Joseph T. Ryerson is vice-president and treasurer; Donald M. Ryerson and Edward L. Ryerson, Jr., are vice-presidents; George G. Moody is second vice-president, and E. L. Hartig is secretary and assistant treasurer.

The Chicago plant has switching tracks to Chicago's 23 trunk line railroads and 36 freight cars may be loaded under cover at one time. The plant is divided into two main divisions, including one warehouse, 500 x 500 ft., housing the heavy material, such as billets, plates and structural material; the other division including a five-story office building and a warehouse 500 x 500 ft., in which are stored bars, shafting, sheets, tubes, rivets, bolts, nuts, boiler specialties, machinery, etc. A complete heated warehouse floor is reserved for sheets and cold rolled strip steel. There is a department especially designed for the storing, cutting and shipping of each steel product.

Competitive Education Between Nations

Other Countries More Alert Than the United States in Their Educational Processes—Americans Should Appreciate the Wealth of Mental Resources Here Dormant and Unused

BY PAUL KREUZPOINTNER*

EDUCATION as a whole, education as an instrumentality to advance their ethical, civic and economic standards in competition with the standards of others, has become as much a matter of rivalry between nations as are the products of factories or commercial methods a matter of such rivalry. This statement may be somewhat of a shock to many who consider education as a spiritual product of a nation's mental activity, and therefore unrelated to the forces which influence and shape the material side of its professional, commercial, industrial and civic life.

Economic necessities and climatic conditions determine the nature, extent and intensity of human activities to sustain life and national existence. And since these human activities will fail in their purpose unless they are properly directed and organized by the well-developed mental capacities and natural spiritual endowments of the people, the educational processes of a country are adapted to the economic needs of that country. And to the extent that these economic needs become more pressing, and to the degree that the educational processes of a people in home, school and public life succeed in shaping and adapting their mental capacities in conforming to these economic needs, to such an extent and degree the material welfare, the moral life and intellectual standard of a people will be maintained successfully and satisfactorily.

Development of Educational Competition

As long as a country is self-sustaining, possessing enough land and raw materials to support its own population without being obliged to depend upon the resources or consuming needs of other nations, the educational processes of such a country can afford to follow the natural, easy-going inclinations of the people and disregard the educational activities of other nations. But there is no country in the world so wealthy in resources that, with increasing population, it will not be compelled to conserve those resources by the application of highly scientific, technical and mechanical processes, which in turn compel the improvement and perfection of its educational methods. This means intensified economic strain on the people. But other nations labor under the same economic strain, and in order to relieve it and to support their growing population nations are encroaching upon each other. That country, therefore, which has at its command the best educational processes to utilize the mental power of its people for this offensive and defensive struggle will be better enabled to relieve their economic strain.

Hence arises the competition, in recent decades, of the educational system in different countries when competing with each other in the products of their industries. These products are the results of mental capacity and physical energy, the quality and efficiency of which depend upon the high or low standard and serviceability of the educational processes applied to develop that capacity and to stimulate that energy; and to the degree of severity of the economic strain prevailing in a given country, to that degree its educational methods will be found to be perfected, effective and efficient. As a corollary, to the degree that the economic strain in different countries increases, to that degree these countries will study, copy, adopt the principles, or, in other words, try to compete with the educational processes of the countries farthest advanced along that line of human activity.

The fact that European countries and Japan are keener and more alert in studying and perceiving the advantages of the educational systems and practices of competing countries than we in the United States have been until recently is not due to any greater degree of intelligence or mental capacity, but to their being subject to an ever-increasing economic pressure—to provide food, shelter and clothing for their steadily growing population. Hunger is the whip which drives those nations not only to study the industrial and commercial progress and methods of competing countries, but no less so to study the educational methods which promoted their superiority, if there be superiority.

Studying Methods of Other Countries

Since the middle eighties, when other countries began to perceive the rapid strides the United States was making industrially, foreign engineers and educational experts have been visiting us in large numbers to study our advantages and disadvantages. We reciprocated in such studies, but with characteristic self-sufficience began rather late to interest ourselves in what other industrial nations were doing and how they lived. As far as study of their educational systems is concerned, the results have often been superficial and misleading, because lacking insight into the historic development and environmental influences which shaped the life of other nations.

From 1886 to 1912, when he was retired from the service of the Pennsylvania Railroad, the writer had the pleasure of meeting on their investigating tours 354 engineers and governmental officers from 17 different countries, the majority of whom were interested in our educational machinery, its working and results. During the World's Columbian Exposition of 1893 he was assigned by the railroad company as a guide to 72 engineers from 12 different countries. A number of these visitors were frank enough to express their conviction that, with our inefficient and inadequate provisions for the education of our working people, they were not much afraid of our competition, notwithstanding our superior industrial organization and mechanical ingenuity.

For many years Germany, more than any other country, has followed the development of our industrial training and technical education, adopting our manual training system for its elementary schools. In 1902 our secondary education was the subject of a study by an expert. The educational exhibit of the United States at the St. Louis Exposition in 1904 was carefully studied by a German expert who also made visits to our schools, and in his published report the belief was expressed that it would take this country many years to perfect its industrial educational system in conformity with its industrial needs if, in fact, it ever should succeed in doing so.

A German expert, who, before the present war, studied our progress in industrial and technical education, remarked to the writer that the American people do not know and do not appreciate the wealth of mental resources lying dormant and unused in our youth. From the standpoint of our industrial and educational needs, we do practically nothing to develop that wealth of mental resources, and, moreover, we do little to strengthen the weak points in our educational system, as there are weak points in every educational system of every country.

How Famous Foreign Schools Are Visited

As a sample of the intensity with which all nations follow this development of competitive industrial and technical education, a study of the list of visitors at

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the continuation schools of Munich, Germany, is highly illuminating. The Munich continuation school system is now considered the best and most effective anywhere, following its reorganization by Dr. G. Kerschensteiner, and since 1908 has been visited annually by hundreds of educators and industrial experts. In 1911 and 1912, there were 610 individual visitors, of whom 383 were from countries outside of Germany. These 383 were from 24 different countries, among them being 73 from the United States. In addition, in those years there were 79 delegations and official commissions counting from 3 to 60 members each, from 11 different countries. Taking an average of 10 members in each delegation and commission, there was a total of 1400 visitors at the Munich schools in two years to learn what they could about the methods pursued. Who will say that education has not become an intensely competitive factor in the life of all countries if 25 nations, including Germany, find it desirable and necessary to study these schools?

France is introducing continuation schools, and there is a bill before the British Parliament now which provides for a reorganization of the British educational system, with compulsory continuation schools up to 18 years of age for all industrially employed, going, in the case of girls, even a step farther than the Munich schools.

The foregoing is a brief presentation of the present aspect of competitive industrial and technical education. While we have made very commendable and praiseworthy strides during the past five years in the organization of public, industrial and continuation schools, shop and apprentice schools and evening schools, and the Smith-Hughes law will help much, yet in comparison with what is needed we have merely made a good beginning.

If Munich considers it worth while to invest $31 per boy and $18 per girl, including building account, in its continuation schools, while Wisconsin spends $11 and Pennsylvania $5 per pupil in their continuation schools then our competitive industrial education is evidently far from what it should be. Taking the list of visitors at the Munich industrial continuation schools as a guide, let us not forget that the United States is only one out of at least twenty-two nations seriously involved in the struggle of competitive national education.

Will Need Machinery After the War

WASHINGTON, Oct. 23.—The attention of engineers, contractors and others interested in public improvements has been called to a report on the needs of Scotland for American machinery after the war is over by the Department of Commerce. This matter was the subject of a report by Consul Rufus Fleming, who is stationed at Edinburgh. Mr. Fleming said:

Notwithstanding taxation will rest heavily upon every community in consequence of war expenditures, soon after the return of peace large projects must be undertaken in this part of Scotland.

Streets and highways have been badly worn by increased traffic and repairs have been deferred; harbor construction and improvements, for which full arrangements were made several years ago, are in abeyance owing to financial and labor problems; and tramway extensions, important housing schemes, sewerage works, industrial plants, land clearing and drainage enterprises, and the development of mines and quarries are among the other works, public and private, which must receive attention when conditions will permit.

American manufacturers and exporters of machines for engineers and contractors in the various lines indicated could probably cover this market in the most satisfactory way from general agencies in English commercial and industrial centers to which the engineering and building concerns throughout the country are in the habit of sending orders for heavy machines of all kinds.

The Modern Tool Co., Erie, Pa., manufacturer of threading tools and grinders, is adding a third story to its plant, 48 x 150 ft., and will move its offices into it, providing for additional plant space. New machinery has been bought, and is expected to be working early in November. Production is to be increased from 40 to 45 per cent. Lyle W. Orr is general manager.

STEADY LOAD WITH WASTE GAS

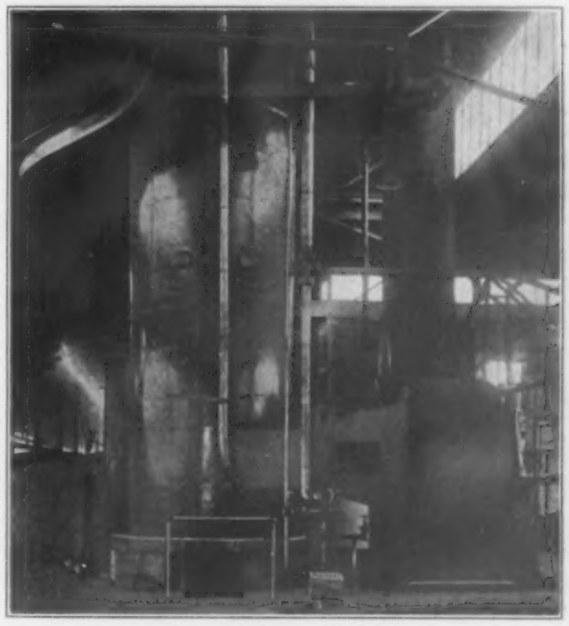
Coal Fire Supplements Waste Heat—Boilers Applied to Two 20-Ton Melting Furnaces

IN a paper presented before the American Foundrymen's Association at its recent convention in Boston, C. D. Townsend, Danville Malleable Iron Co., Danville, Ill., gave the following description of waste heat boilers as applied to two malleable melting furnaces:

After investigation of various kinds of boilers, including horizontal, marine and others, the Danville Malleable Iron Co. selected an upright water-tube boiler as best suited for the utilization of waste heat from melting furnaces. That the floor space required was comparatively small was an important factor in determining the choice. A 250-hp. boiler was estimated to be of sufficient size, considering the grate area of the furnace; but because of what might be called a superheated gas after it has passed over a bath of molten metal, and because of its velocity, greater capacity was deemed advisable and a 400-hp. boiler was finally selected.

Auxiliary Fire-Box

To get constant results from the boiler, and also maintain constant steam pressure, it was thought best to have two furnaces and an auxiliary fire-box connected with the boiler. By running the furnaces one



Draft Induced by a Fan Connected to the Stack of the Waste-Heat Boiler is Found to Improve Regulation

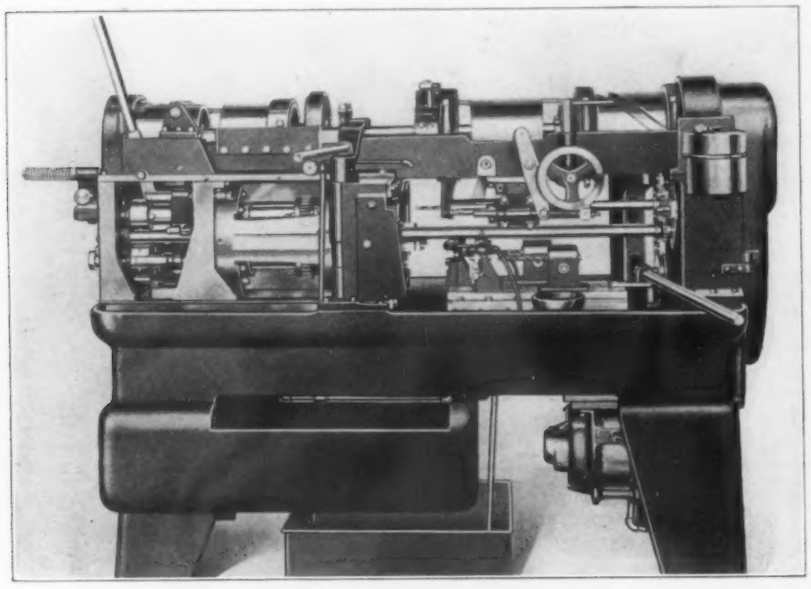
at a time, a full head of steam can be kept on the boiler, except for intervals during the time of charging the furnaces, and for a short period while the cold stock is being thoroughly heated. This takes care of all firing for at least nine hours of the day. During the balance of the day the boiler can be kept under pressure by a small fire in the auxiliary fire-box. One furnace is operated while the other is being repaired.

Induced Draft Regulation

Temperature control in the furnace and the efficiency of the boiler can be aided by the addition of an induced-draft fan in the base of the stack. By operating this fan with variable speed the furnace draft can be regulated and the fan tends to hasten the time of melting. The temperature in the base of this stack is approximately 800 deg. Fahr., and the temperature at the back bridge-wall of the furnace is about 2500 deg. Fahr. This equipment evaporates approximately 246,000 lb. of water per day, using in the auxiliary fire-box from one to three tons of coal.

The boiler should be set as close as possible to the

back bridge-wall of each furnace to utilize all the waste gas possible. This can be accomplished by setting the furnaces parallel to each other or at right angles to the boiler. To take care of the large amount of gases that pass through the boiler during the period of melting, the boiler should be set eccentric with the casing, leaving the greatest area on the front or steaming side of the boiler so that the extremely hot gases have a chance to rush up the front and become effective near the top. If the boiler tubes are set close to the casing, the intense gases and impinging flames will do most of their work on the tubes near the bottom of the boiler.



Placing the Cams at the Top of the Machine Avoids Clogging Due to Falling Chips

The water supply for a waste-heat boiler should be absolutely assured. Two independent sources of supply should be provided and all piping and valves should be extra heavy and erected with care. Expense should not be considered too largely in making the water and steam connections.

The most desirable service of a waste-heat boiler can be obtained by using it in conjunction with a battery of hand-fired boilers, the steam pressure to be equalized and balanced by their use. In this way the waste-heat boiler serves as an auxiliary or a fluctuating source of steam supply to a boiler plant.

Care of Boiler

A waste-heat boiler requires constant attention. The water supply must be positive and intelligently supplied. The boiler should be washed down and the tubes inspected for defects at least every three weeks, and the flues should be turbined, if necessary, not less than every six weeks. Treated water should be used to minimize the collection of boiler scale. Soot should be blown off the tubes at least three times a day.

A 400-hp. boiler connected with a 20-ton furnace operating at capacity will produce steam at full capacity or a little in excess after the iron has been reduced to a semi-fluid state or for eight or nine hours per day. There is no noticeable effect on the furnace operation and, in fact, the furnaces are operated without regard to the boiler connection. The fuel ratios do not change; neither do the furnace firing operations.

"Utility Letters of Credit in the Export Trade—A Plea for Standard Forms" is the title of a new pamphlet issued by the American Steel Export Company of New York. The author, J. P. Beal, who is secretary and assistant treasurer of this company, makes valuable recommendations to the American banker and exporter.

The Philadelphia office of the Brown & Sharpe Mfg. Co. will be removed on Nov. 1 from the Bourse Building to 1103-1105 Liberty Building, Broad and Chestnut streets.

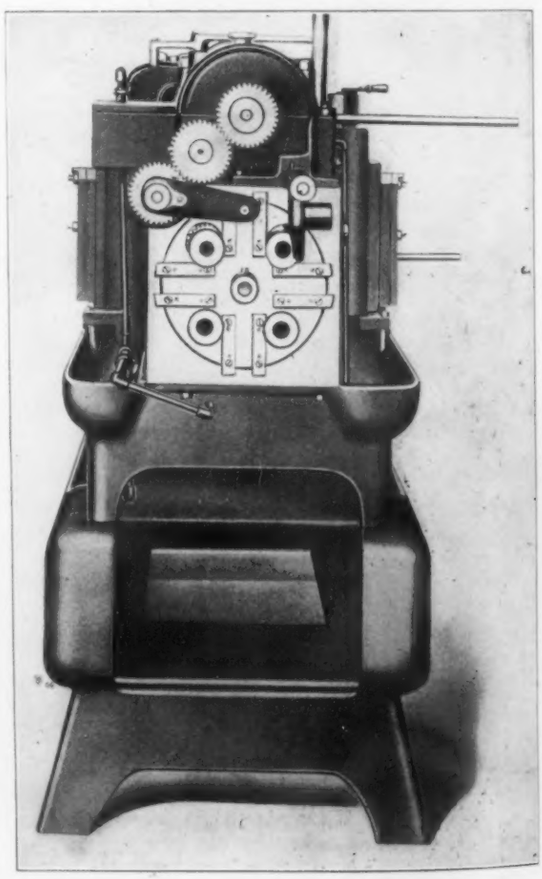
NEW FOUR-SPINDLE AUTOMATIC

Screw Machine Embodying a Number of Notable Changes in Design

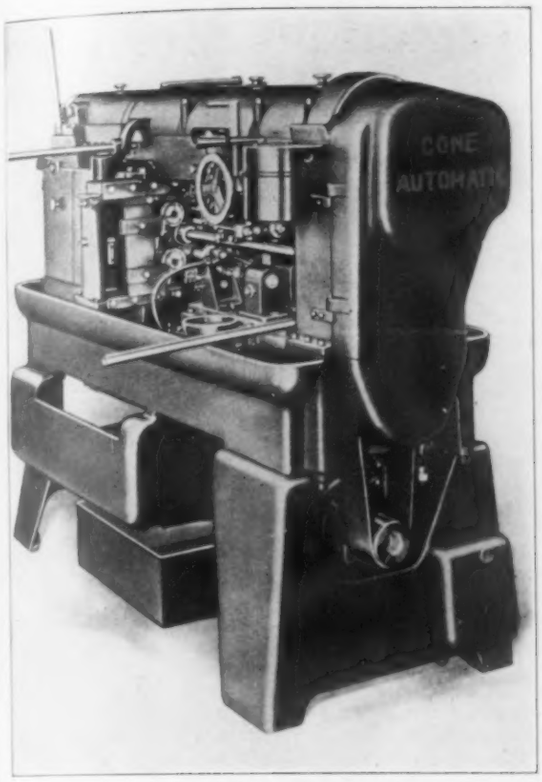
THE Cone Automatic Machine Co., Windsor, Vt., has placed on the market a four-spindle automatic screw machine of new design. The cam is located at the top of the machine, the starting and finishing of the work is done at the front of the machine in full sight of the operator, a single belt drive is employed and a convenient means of disposing of the chips is provided for. Care has been taken to protect the moving parts, and where the guards are not an integral part of the machine they are made light so that replacement will not necessitate such exertion on the part of the operator as to leave them to be neglected and out of use for periods at a time.

The machine is mounted on legs, an arrangement which provides space for putting the driving motor underneath one end of the bed as well as furnishing space for a receptacle for the chips. The chip-retaining pan, it is pointed out, may be cleaned without interfering with the operation of the machine and at the same time the operator can push the chips along toward the end of the machine, should he desire.

The arrangement of the four hollow spindles through which the stock passes is clearly brought out in one of the accompanying illustrations. The work is started in the spindle at the lower left corner and passes around in a counter-



The First and Last Operations Are in Full View, the Work Starting in the Lower Left Spindle and Progressing in a Counterclockwise Direction



After the Work Is Cut Off in the Upper Spindle, the Completed Piece Drops through the Opening at the Right of the Bed into a Tote Box or Other Receptacle

clockwise direction to the spindle in the upper left corner, where the finished piece is severed from the stock and drops into the metal cup at the right of the bed. This cup delivers to a tote box or other receptacle for receiving the finished parts. The relation of the first and last operation spindles and the metal cup for receiving the finished work are clearly shown.

The spindles are indexed by a cam mechanism which is located at the top of the machine, with no likelihood of the cams becoming clogged by chips. The cams are protected by removable covers of sheet metal which are light enough to facilitate removal and replacement and at the same time stiff to withstand hard usage.

An electric motor operating at a speed of 1800 r.p.m. is employed to drive the machine through a single belt As will be noted, the motor is mounted underneath the bed and the other transmissions are of the gear and chain and sprocket type.

Only One Belt Is Employed in Driving the Machine, the Remaining Transmissions Being of the Gear and Chain and Sprocket Types

Central Steel Co. Additions

The Central Steel Co., Massillon, Ohio, is making a number of additions to its plant and is planning further enlargements for next year. These will include the building of an electric steel plant equipped with two 15-ton electric furnaces. A 22-in. bar mill, which is expected to be placed in operation about Jan. 1, is being installed and a steel foundry and other extensions have just been completed. In addition, two 75-ton open hearth furnaces were recently placed in operation, making nine furnaces in all, the others being of 50-ton capacity.

The new 24-in. bar mill, which consists of two stands of rolls, will be located at the side of the sheet bar mill in the continuous sheet bar mill building. Ordinarily, the steel will go directly from the blooming mill to the sheet bar and billet mill for producing small billets up to 6 x 6 in., but small billets and bars may be rerolled on this mill, and two reheating furnaces are being installed in connection with it. A 40 x 60 ft. hot bed and a saw built by the company and a 6 x 6 in. McIntosh shear have been installed in connection with this mill. As the billet and sheet bar mill and finishing mill will not be used at the same time, the power equipment now used for the former will also be used to drive the new bar mill.

The steel foundry was placed in operation a few days ago. This occupies a new building, 50 x 150 ft., served by a 15-ton Morgan crane and equipped with a 1-ton electric furnace built by the company that is used for experimental work. A track leads from the foundry building to the open-hearth building and the molds will be taken to the open-hearth plant for pouring, the molten metal being supplied by open-hearth furnaces. Steel castings will be made up to two tons. The product of the plant is almost exclusively alloy steel.

New plant extensions just completed include a stripper building, 60 x 120 ft., equipped with a 200-ton Morgan stripping crane, a pickling plant occupying a 40 x 250 ft. building and a billet shed 88 x 250 ft. A new 15-ton Morgan crane has been installed in the stock house and a new two-story storeroom, 40 x 100 ft., and a new four-story office building, 50 x 100 ft., are now being erected.

Pittsburgh Foundrymen's Association

The monthly meeting of the Pittsburgh Foundrymen's Association was held in the Fort Pitt Hotel on Monday evening, Oct. 15, in that city, and was preceded by a dinner. L. A. Way, president, was in the chair, and W. W. Sanderson of the Carborundum Co. acted as secretary, owing to the illness of F. H. Zimmers, the secretary. N. Kelly & Son Foundry Co., and the Bronze Age Metal Co., were elected new members. The speaker was Major C. M. Wesson of the ordnance department, U. S. A., who is officer in general charge of manufacture at the Watertown arsenal. Major Wesson spoke on the making of steel castings for ordnance work and discussed the unusual physical requirements demanded in castings to be used in artillery gun mounts and other ordnance.

The Wisconsin Gun Co., Milwaukee, organized by five leading metal-working interests of Milwaukee to manufacture 3-in. field pieces for the Government, celebrated the speedy completion of its new shop at Thirty-fifth Avenue and Orchard Street on Saturday, Oct. 20, by holding flag-raising exercises. The shop is 130 x 300 ft., and was completed in just 51 days by the Worden-Allen Co., Milwaukee, general contractor, or 39 days ahead of the date specified in the contract. By Jan. 1 the company hopes to be able to turn out three pieces of ordnance a day.

Reports from Detroit state that work on the Ford blast furnaces west of that city is progressing rapidly. A small army of men is at work excavating and building, and construction will be continued during the winter.

Cast-Iron Shells in Permanent Molds*

Some of the Essentials as to Composition and Design of Mold—French Practice and Specifications

BY EDGAR A. CUSTER

THERE is nothing new in the use of cast-iron projectiles—before the age of steel they were the sole means of battering down defenses and attacking at long range. Some of the reasons why the use of cast-iron shells was abandoned are that the metal has never had a very good reputation for uniformity and freedom from sponginess and gas holes; its tensile strength is low and it lacks toughness. Any of the defects commonly found in cast iron will seriously affect the trajectory and direction of a shell and render it comparatively useless. A forged steel projectile meets all objections and has the call.

The objection to steel projectiles is that they are comparatively ineffective against earthworks or trenches when the caliber is 5 in. or less. The amount of contained explosive is small and a great proportion of the explosive effect is used in bursting the walls of the shell. In larger sizes this objection is less apparent. The explosive effect increases with the added charge in a greater ratio than the strength of the added amount of metal in the projectile. The present war has taught us that steel, concrete and brickwork offer but little resistance to modern siege guns and they have been abandoned for earthworks manned with an ample force.

A few years ago some experiments were made on the lower Chesapeake to determine the effect of cast-iron shells on the superstructure of a condemned war vessel. One shell that penetrated the structure and burst in a wardroom was particularly observed. The room was about 20 x 60 ft. and one side was lined with lockers. Every locker was torn to pieces and the paint on the walls and ceiling in the line of the explosive force was cut off as with a sand blast. It was the unanimous opinion that the explosion would have killed every man who happened to be in the room at that time. A few tentative experiments were made after this and a permanent mold was constructed, but the project was allowed to drop and no effort was made to thoroughly investigate the subject.

The first intimation that cast-iron shells were being used in the present war was an article in the London *Engineer* which described a number of fragments of cast iron that were undoubtedly portions of an exploded shell. It was noted that some of the pieces were slightly chilled on one side and the *Engineer* surmised that cast-iron cores were being used. As the peculiarly destructive effect of these shells was observed not only in the open but also against earthworks, the idea that the Germans were using cast-iron shells on account of the scarcity of steel was abandoned. As a matter of fact, as early as May, 1913, German and Italian munition makers were discussing this phase of projectile work and were seeking all the information that was available. In August, 1913, it was reported to the writer that shells had been made that were satisfactory in that they had the proper degree of fragmentation and were strong enough to resist the effect of the propelling charge. Moreover, these shells were made in iron molds with iron cores.

Essentials of Cast-Iron Shells

It is essential for the work that the degrees of fragmentation of shells be calculated to a nicety. Too great fragmentation will make the shell ineffective. A steel shell weighing 13½ lb., when charged with one pound of TNT, will burst into approximately 1050 pieces if there is complete detonation. The largest pieces average 0.3 to 0.4 lb. in weight and many of these are splinters due to the fibrous nature of the metal. The fragments recoverable have a wide variation in weight, as shown by the fact that while the average weight of the large fragments is almost half a pound, the average weight of all the fragments is about 0.01 lb. It follows that a very large per cent of the fragments would do no harm. A cast-iron shell under the same conditions would burst into nearly 1500 pieces with the fragments comparatively uniform in size and weight.

When it comes to making a projectile of cast iron that is to be used against an enemy, a number of difficulties are met. It must be very strong, easily machined, absolutely solid and free from spongy spots and blowholes, and above all, every shell must have exactly the same degree of toughness. To meet these requirements, the foundry must be run on a strictly scientific basis. There can be no guess work. When shells are cast in sand, the elements of carbon, silicon and manganese must be held to very definite limits, and these limits vary with the thickness of the shell walls, which can only be determined by trial. The point aimed at is the correct degree of fragmentation and all foundry methods must aim at this. Dry-sand molds, open and porous; perfect cores and trap or swirling gates must be used. The methods of melting and care of iron and fuel must be carried out whether the shells are made in sand or in a permanent mold.

Foundry Iron in Permanent Molds

Ordinary foundry iron, when properly cast in a permanent mold and when removed at the proper time, has, in the resultant casting, the same degree of hardness irrespective of any variation in the chemical constituents, so long as the same size, weight and shape of casting is made. The time the casting remains in the mold is the determining factor of the degree of hardness. A casting weighing about 60 lb. remains in the mold four or five seconds, while a casting of the same general contour weighing 500 lb. will require from 25 to 60 seconds before it is safe to lift it out.

To illustrate this point, data on a casting weighing 1100 lb. are presented. Fig. 1 shows the general outline of a mold that was used to make a shell bushing. A trap gate was used and the casting had a very heavy base and comparatively thin upper walls. In fact, about 65 per cent of the total weight was concentrated in the lower third of the casting. This large mass of metal increased the time interval in that it was necessary to set the walls deeper than in a casting of smaller bulk. There were no risers and the only means provided for the escape of air from the matrix were a few shallow channels cut into the mold at the top of the casting. A large cast-iron core operated by a hydraulic cylinder formed the interior cavity. The mold was opened and closed by a similar cylinder. Into this mold irons of the following analyses, all of which were melted in an ordinary cupola, were poured:

	Mixture No. 1	Mixture No. 2	Mixture No. 3	Mixture No. 4
	Per Cent			
Manganese	1.50	0.50	0.80	1.50
Sulphur	0.03	0.05	0.06	0.02
Silicon	1.05	1.75	2.25	1.05
Phosphorus	0.05	0.06	0.06	0.05
Steel scrap	...	...	...	16.00

From 10 to 12 castings were poured from each of these irons and when the castings were broken not one showed the least sign of sponginess or gas holes. The mold was poured full and the first part to freeze was the entrance gate so that there was no possibility of

*From a paper presented at the thirty-second general meeting of the American Foundrymen's Association, Boston, Sept. 24 to 28.

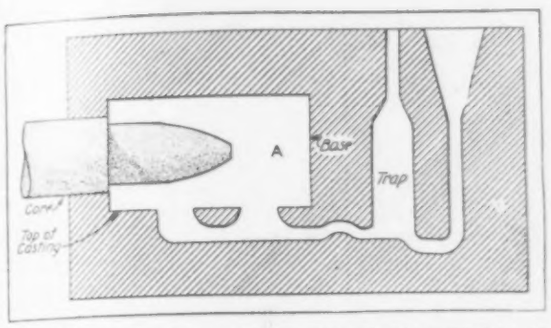


Fig. 1—Two-Part Cast-Iron Mold or Shell Bushing With 15-In. of Metal Surrounding the Gates, Runners and Casting

feeding. Only enough iron was poured to fill the cavity.

The time of setting was measured by the time the core remained in the casting before it was safe to draw it. No. 1 iron required 1 min. and 20 sec. before the core was drawn. When the core was allowed to remain in the casting 1 min. and 30 sec., it was gripped by the iron and had to be cooled to room temperature before removal was possible. No. 2 iron required 1 min., and No. 3, 30 sec. In No. 4 a new condition was set up when 16 per cent of scrap steel was melted with the charge in the cupola. In this case it was 2 min. and 20 sec. before the core could be withdrawn. The results show that in a casting of this size the low silicon iron cools much slower than one of higher silicon content. The effect of the long time in the mold was to make the casting very hard and heat treatment was given to bring it to machinability. The temperature of the core had no effect on the time of setting. The tenth casting was given the same time as the first, although the core was heated to a temperature of over 400 deg. Fahr.

Mold for a 60-lb. Shell

A mold was made for a shell that, when finished, weighed 60 lb. The mold was made in three parts, as shown in Fig. 2, and was equipped with a cast-iron core. The portion of the shell forward of the bourlette band is cast in the solid part of the mold and no provision is made for venting. The parting of the movable portions of the mold runs in a straight line through the center of the shell and extends 3 in. beyond the base. It then turns at an angle of 45 deg. and runs straight the remaining distance to the outside of the mold. The pouring cup is placed about 5 in. from the outer end of the parting and the main sprue runs down to an easy curve to the bottom of the trap. The entrance to the trap is ⅜ in. in diameter, while the main sprue is 1½ in. in diameter. The trap gate is 5 x 4 in. with heavy filleted corners and open at the top. The sides are given ⅛ in. draft, so that the moving parts of the mold will open readily. The bottom of the trap is set low enough to allow a slight hump to be placed in the runner between the trap and the matrix. This hump serves to catch any air or dirt that may be carried with the first rush of the metal. The center line of the runner is 3 in. below the bottom of the matrix and two gates are cut—one between the revolving band and the base and the other between the band and the bourlette. The gates are 1/16 in. wide and have a small fillet where they enter the matrix. The mechanism for drawing the core is attached to the part *A* and moves with it. Channels are cut in *A* and *B* in the proper position to receive the copper band.

The operation of casting is as follows: The copper band is placed in the channels, the mold closed and then poured as fast as the runner will take the metal, keeping the pouring cup full until the end. In four seconds the core is withdrawn, the mold opened and the casting removed. The copper band will be firmly cast into place.

It was found that a mixture corresponding to No. 4 in the experiment previously mentioned, with the exception that the manganese was under 0.08 per cent, gave the casting the toughness necessary for the proper degree of fragmentation, but the long exposure in the mold made the casting too hard. A scleroscope reading of 65 to 70 was the invariable result irrespective of any difference in the mixtures.

It was evident that some form of heat treatment was necessary to bring the casting to a workable condition. It had been determined that a mark of 45 would give the proper degree of fragmentation. A number of trials were made before it was found that a "flash" heat of 865 deg. Cent. would restore the casting to a good workable condition and bring the scleroscope to just about the correct figure. It was further found that the castings should be allowed to cool before being subjected to the treatment so that a number of shells could be treated at the same time, starting at the same basis of temperature.

In a permanent mold, it is impossible to get a casting free from gas or air holes without the use of trap gates. There is no trouble in filling the mold when semi-steel is used. The metal does not need to be poured especially fast. Nevertheless, unless a substantial trap gate is provided, small holes will collect against the bottom of the core and the top of the casting. The most careful pouring will not change this condition. There is a point when semi-steel can be poured in a permanent mold without these holes forming and without trap gates, and that point is when the metal has cooled until it is almost viscid. The difficulty of successfully hitting this point is so great as to make this method beyond the range of commercial success.

Time a Vital Factor

The selection of different irons for different sizes of shells, made in permanent molds, is not necessary. To explain this, the influence of silicon and manganese is exerted only when the molten metal is cooling in the mold and the total effect of this influence is measured by the time the molten metal takes to become solid. In a sand cast projectile weighing 65 lb., the time is five minutes; in a permanent mold casting the time is five seconds.

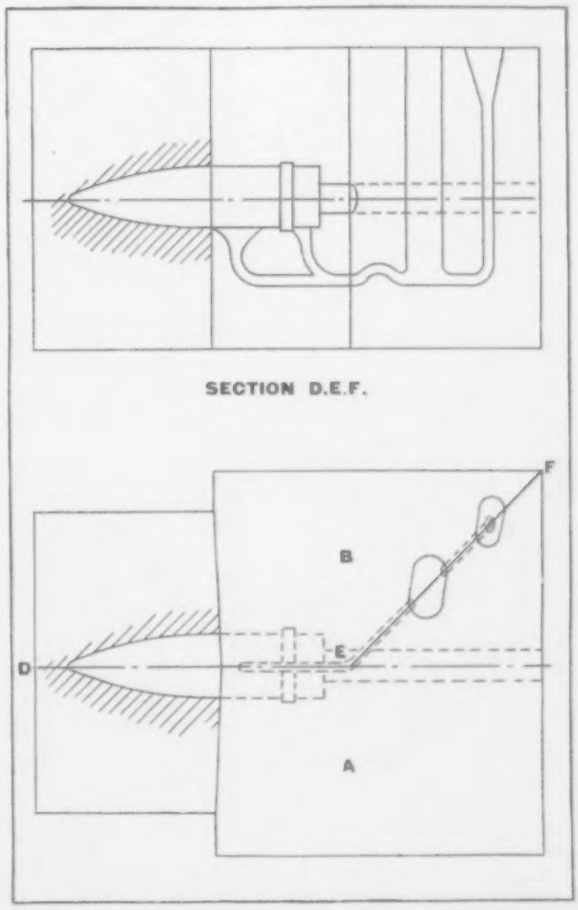


Fig. 2—Sketch of a Three-Part Permanent Mold for a 60-Lb. Shell

When cast-iron shells are used in the open, the fragmentation must be exact, but when used against earthworks, only the explosive force counts. Since it is impossible to set aside shells for each duty, it is obvious that the degree of fragmentation must govern the process. This is easier to accomplish with a permanent mold than by any other known process. As has been said, the question of hardness does not depend upon the variations of the pig iron so long as ordinary foundry iron is used. The same statement is true of the so-called semi-steel so long as the same percentage of steel scrap is melted with the iron. The term "ordinary foundry iron" is used to denote pig iron ranging from 1.75 to 2.75 per cent silicon, below 0.80 per cent manganese and with sulphur below 0.08 per cent. Phosphorus has no appreciable effect up to 1 per cent. A casting that would analyze 3 per cent total carbon, 1 to 1.20 per cent silicon, 0.60 per cent manganese, 0.05 per cent sulphur and 16 per cent steel scrap would be an ideal composition for a 60-lb. shell. All shells, whether cast-iron or steel, must be subjected to a definite heat treatment and, in the case of cast-iron, the degree of heat and time of exposure to get the proper scleroscope test can be determined only by experiment.

As to the design of the mold, the main point to be considered is that plenty of metal should surround not only the matrix but also the sprues and runners. In a casting such as a 5-in. shell there should be at least 10 in. of metal outside of every portion of the mold that comes in contact with the molten metal. The purpose of this is twofold, to provide a sufficient heat storage capacity so that the molten metal will be robbed of its heat in the shortest possible time and to make the mold strong enough to resist the tremendous expansive power of the cooling metal. The matrix and the core should be made to the exact size of the casting before finishing.

Make no allowance for shrinkage. Why there is no apparent shrinkage when these castings are made in a permanent mold is a moot subject. It may be that, since the interior of the casting is molten when it is taken from the mold and the outside contraction has not started at the time of removal, the expansive force of the cooling interior metal will neutralize the contracting force of the cooling exterior. It is a very interesting point, but it is true that when the casting is so thick that the interior is molten at the time of removal, shrinkage may be safely ignored.

The mold should also be so equipped as to be easily and quickly opened and closed. The movable portions should run on grooved wheels fitting V-shaped tracks. The purpose of this is to prevent small particles of iron interfering with the adjustment of the moving parts. Casting is apt to be a sloppy proceeding and there are always small particles of iron splashing around. Mount the molds so that there is plenty of space underneath to collect any molten metal that may carelessly escape. Before closing the mold, run a flat scraper over the face to remove any small particles that may adhere. If these general rules are followed out, two 60-lb. shells can be cast every minute and all will be of the same weight, size and texture.

The position of the copper revolving band is an important consideration. In some steel shells this band is placed within a very short distance of the base, but in a cast-iron shell plenty of metal must back up the band. Even with the strength that steel gives, portions of the base are sometimes torn off by the tremendous force set up when the band enters the rifling at a very high velocity. The effect of this rupture is to disturb the trajectory and direction to such an extent as to render the shell not only useless but dangerous.

French Specifications for Iron Shells

The French Government has issued specifications for shells cast in sand that are here given in part. They call for the analysis of shells of 122 to 155 mm. caliber. The chemical analysis is given at the top of next column.

	Per Cent
Graphitic carbon	0.70
Combined carbon	2.40
Silicon	1.35
Manganese	0.70

The amount of total carbon and silicon must not exceed 4.7 per cent. If this limit is exceeded, the iron will lack toughness. At least 2 per cent of the total carbon must be combined to produce proper fragmentation. The percentage of dust increases as the combined carbon decreases.

Although the sum of total carbon plus silicon is set at 4.7 per cent, it is preferable to keep these limits to 4.4 per cent with a minimum percentage of silicon. The percentage of silicon varies according to the type of molding. In the 122-caliber the best results were obtained by using a minimum of 1.20 per cent silicon for dry sand and 1.35 per cent for green sand. The percentage of silicon varies in inverse ratio to the thickness of the walls and the caliber; the thicker the wall, and higher the caliber, the lower the silicon. Manganese decreases with the thickness of the walls and caliber and increases with the sulphur.

The sulphur should never exceed 0.08 per cent and should be lower whenever possible. The percentage of phosphorus is set at 0.15 per cent or under. The charge should be as follows:

	Per Cent
Pig iron	40
Scrap	40
Steel	20

The term scrap is used to denote scrap melted, pigged and charged according to analysis.

These specifications correspond closely to the iron previously mentioned as being ideal for use in permanent molds. The striking point is that the silicon decreases when a dry-sand mold is used, and this point is emphasized by the use of a still lower silicon in a permanent mold. The percentage of combined carbon will always be high when a permanent mold is used. Once the proper mixture has been determined, that mixture is used irrespective of the thickness of walls or caliber of shell.

All the foundries of France engaged in this work have been mobilized on a common basis and are using precisely the same methods of selection, analysis and general foundry procedure. This has not been done without enormous losses and vexatious delays. There have been many cases where the loss of the total heat has been reported and a loss of 40 per cent was not uncommon in the first stages. Team work, scientific methods and keeping everlastingly at it have brought results. To-day the output has reached staggering proportions—over 1,000,000 rounds per day are being made.

It is very hard to say that it is doubtful if there is a foundry in the United States that could qualify at once for this work without material changes in procedure. Primarily, it is not a commercial proposition and if this Government decides to use cast-iron shells, the work must be undertaken with the foreknowledge that trouble is ahead. The necessity will be paramount of not only putting forth prodigious efforts but also of sinking individuality for the common good. A full and free interchange of ideas and data is indispensable. There is no doubt of the ultimate outcome.

Floor Type Tapping and Drilling Machine

W. H. Simmons & Co., 208 Lawrence Street, Cincinnati, is now building a floor type automatic drilling and tapping machine in addition to the bench type which was illustrated in THE IRON AGE, June 21, 1917. The general appearance of the machine is the same as the earlier one, except that a pipe section column is used in place of the former rectangular one. The machine has a clutch and reversing mechanism which can be set to run the tap to any desired depth and then reverse and stop the spindle automatically. This clutch is of the jaw type, and a sensitive drive for light tapping or tapping soft metal is secured by adjusting the belt through the movement of the lower pulleys, which are mounted on an eccentric shaft. The machine will drill or tap to the center of a 12-in. circle and is provided with four attachments for tapping 16, 18, 20 and 24 threads per in.

Nitre Cake for Pickling Brass

Nitre cake, as a substitute for sulphuric acid in pickling brass, is finding extensive use in Great Britain according to a paper by H. W. Brownsdon before the Birmingham section of the Society of Chemical Industry. The quantity so used in that country now runs into several hundred tons per week. Difficulty in obtaining raw material, coupled with the increased demand for sulphuric acid for other purposes, has resulted in an extended application of nitre cake solutions in place of dilute sulphuric acid for pickling annealed brass.

Nitre cake is essentially crude acid sodium sulphate, and while the latter in the pure anhydrous state contains theoretically 40.8 per cent of sulphuric acid, the free acid found in nitre cake may vary from 5 to 30 per cent. For pickling, the nitre cake solution should show 3 to 5 per cent sulphuric acid on titration; there is no advantage to be gained in using solutions of higher acid concentration.

While nitre cake is a variable product, annealed brass from a pickling point of view may be even more so. Given clean work, nitre cake solutions replace dilute sulphuric acid quite efficiently, but with dirty work the difference is much more marked, and nitre cake solutions, even under the most favorable conditions, may fail to pickle the work satisfactorily. It is little consolation for the manufacturer to know that his troubles lie in his annealing furnaces. Much may be done to overcome troubles as follows:

The nitre cake solution should be as hot as possible.

Its acid content should be tested frequently and maintained at 3 to 5 per cent by the addition of nitre cake.

The hot annealed products may be quenched in water whereby much scale is mechanically loosened prior to pickling.

The hot annealed work may be placed direct into the nitre cake solution, and the pickle can thus be maintained at a high temperature without auxiliary steam heating.

Oxidizing agents such as ferric salts, bichromates or persulphates may be added to the pickle, but in many cases the price is prohibitive.

Electrochemical aid might be sought by using a low voltage current, making the lead lining of the vat the cathode and the work to be pickled the anode.

Movement of the work in the pickle, or the agitation of the pickle during pickling, or both.

The difficulties met with in the successful use of nitre cake solution can only be overcome in a satisfactory manner by paying close attention to the conditions governing the annealing so as to obtain the annealed brass as clean as possible, and by using the nitre cake solution under conditions which will most strongly stimulate its pickling activity.

Swedish Iron-Ore and Steel Output in 1916

Iron-ore exports from Sweden in 1916 were less than in 1915, or 5,339,000 metric tons, as compared with 5,994,000 tons. The 1913 exports were 6,440,000 tons. The pig-iron output fell off slightly in 1916, having been 737,300 tons, or 30,300 tons less than in 1915. It was, however, about 93,000 tons more than the yearly average for the last 10 years of 643,700 tons. The Bessemer steel production decreased last year 15,000 tons but the open-hearth output increased 25,000 tons. Iron and steel imports in 1916 were 28,000 tons greater than those for 1915, when they were 230,000 and 17,000 tons more than the yearly average for the last 5 years.

New Electric Steel Foundry in Ohio

The Fairbanks Steam Shovel Co., Marion, Ohio, is building a new steel foundry, 62 x 300 ft., one story, equipped with a 1½-ton Snyder electric furnace for making steel castings, forging billets and ingots. It is expected to be in operation by Jan. 1.

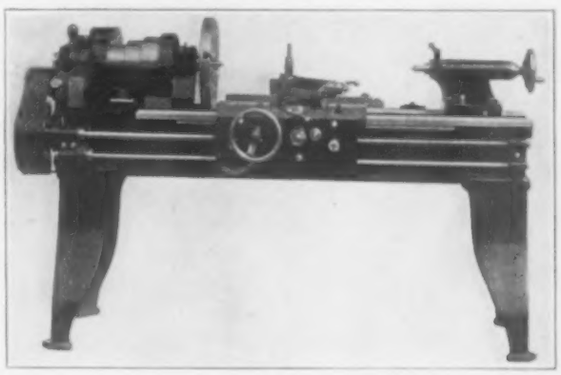
The Philadelphia section of the Association of Iron and Steel Electrical Engineers will hold a meeting on Saturday evening, Nov. 3, at the Majestic Hotel, Broad Street and Girard Avenue. No general paper has been announced.

A 14-in. Lathe with Special Feed

The American Machine Tool Engineering Works, Chicago, has placed on the market a 14-in. back-geared lathe. Among the points about its construction that are especially emphasized are the use of a feed change lever on the apron, an extra long tailstock spindle and a lever for shifting the double back gears that is placed within easy reach of the operator. The lathe is designed for both toolroom and manufacturing work and is supplied with a large number of change gears, thus providing for a wide range of thread cutting of both English and metric pitches.

The headstock of the lathe is of the bowl type and has a 0.60 per cent carbon crucible steel spindle. The spindle is bored to hold a bushing with a No. 3 Morse taper, and the bearings, which are of bronze, are finished by scraping to fit the spindles. The lathe has a swing of 14⅝ in. over the ways and a 6-ft. machine will mount work 36 in. long between centers. A three-step cone pulley ranging in diameter from 5½ to 8 in. drives the spindle, the power being transmitted from the countershaft by a 2½-in. belt. The spindle has 18 speed changes ranging from 30 to 655 r.p.m. The lever for shifting the back gears is located at the end of the headstock, where it is within easy reach of the operator.

The carriage has a bearing 23 in. long on the V's and the bridge is 7¼ in. wide. The feed rod is driven from the headstock by a train of gears through an overload friction, thus eliminating the feed belt and at the same time providing a safety device in case of accident. The feed change lever is located in the apron, and by moving this lever to any one of four positions it is possible to vary the cross and longitudinal feeds. This arrangement, it is explained, is in addition to the feed reverse levers usually found in lathe aprons. A safety device is also provided in the apron to prevent the half nuts from engaging with the lead screw when either of the feeds is engaged or vice versa. The tailstock spindle is 1¾ in. in diameter and has a travel of 8 in. A metric lead screw and change gears for cutting threads from 1 to 7 mm. may be supplied if desired.



Four Changes in the Cross and Longitudinal Feeds of a New 14-In. Back Geared Lathe Are Secured by Moving a Lever on the Apron

The Page Woven Wire Fence Co., Adrian, Mich., and Monessen, Pa., which has been doing business under that name for 30 years, has announced a change in its corporate title, effective Oct. 22, to the Page Steel & Wire Co. The announcement says that the change in name involves no change in attitude toward any of the old lines of production, but has been decided upon because of expansion of the company's business in such a way that the old name has been outgrown and is a misfit. The parent business of the company was wire fencing, but it has developed other products, among them wire rods, rope wire and spring wire, and it also has made arrangements with the American Rolling Mill Co., Middletown, Ohio, and the Copper Clad Steel Co., Pittsburgh, for the exclusive sale of iron and steel wire manufactured by these companies. The Page Steel & Wire Co. announces also the opening of an office in the Union Arcade, Pittsburgh, in charge of E. C. Sattley, general manager.

Steel Plant Electrical Safety Provisions

In a paper presented at the eleventh annual convention of the Association of Iron and Steel Electrical Engineers, Philadelphia, Sept. 10, Walter Greenwood, safety engineer Carnegie Steel Co., Ohio Works, Youngstown, Ohio, discussed automatic engine stops, switches and cranes from the viewpoint of safety.

Automatic Engine Stops

Automatic engine stops of some kind, he said, were found installed on nearly every engine the turbine or flywheel of which burst in the last 10 years and, if possible to do so, he believes they should be so constructed that with ordinary attention they will not fail to operate when required, regardless of the inconvenience they may cause by operating unexpectedly by reason of their own imperfections or by failure of their operating agency. In each of five cases of burst turbines which have come to his attention, the turbine was equipped with an automatic controlling device which failed to prevent the explosion.

He gave as a reason for favoring an electrically operated unbalanced stop valve, installed along with such other automatic devices as may be required, that an electrically operated valve may be operated from numerous points remote from the engine if desired. Where electrical stops are used an independent generating outfit connected to a wet battery should be installed in a plant of any considerable size. This would insure against failure of current, but to further insure against such failure a switch should be supplied to automatically cut in current from one of the most reliable circuits of the generating station in case the independent generators failed or stopped. He recommended that an emergency valve never be placed with the stem on the underside and that on all engines the oil be fed in ahead of it. Valves on turbines, he said, can be given sufficient lubrication to prevent corrosion or accumulation of matter around the stem, and the lubricant should be injected directly on the valve stem in a quantity so small that it can have no noticeable effect on other parts of the turbine.

There exists, he believes, a hazard from blast-furnace blowing engines over-speeding and that this can be reduced by installing unbalanced valves kept open by a magnet, but not automatically closed from overspeeding. These could be operated by breaking the circuit from various remote points. The process of stopping an engine by closing the throttle, he believes too slow, even though an attendant is near at the critical time. A valve such as he has in mind would check the speed of the engine without stopping it entirely.

Switches

Regarding switches, he recommended that the operating engineer be satisfied only with a switch that possesses all requirements for economic operation, and he believes that such operation is possible from a good safety switch. The interlocking feature to positively prohibit closing a circuit before closing the switch encasement, he believes, is of less importance than the matter of seeing a switch in operation while inspecting it. He recommended further that switches be constructed for quick break and for a quick closing; that they be inclosed by waterproof encasements of noncombustible material; that their throw be made from the outside of the encasements by levers or rods so that the circuits can be closed or opened without opening the casings; that except for a few exceptional purposes, they be fused on the side that is dead when the circuits are broken, and that provisions be made for locking them open with a considerable number of locks.

The claim that low voltage will not injure a person unless his heart is not in normal condition, he says, seems to have been contradicted in one particular case brought to his attention in which two men were electrocuted by contact with the same wire, carrying low-voltage current, in the same place and at the same time.

Stops on Crane Runways

A suggested safety provision for use on crane runways, which he said has been very popular with safety men, is a track stop fastened to the rail, but he believes that safety can be provided for in the arrangement of the wire installation so that a simple appliance can be set at any point on the track to break the current and apply the brakes to the crane. Between the two methods, stopping the crane by an obstruction that adds a new hazard and stopping by manipulating the current, the latter he held should have the preference.

Improving Correspondence Discussed

Recognition of the importance of better business correspondence found expression in a convention arranged by the Norton Co., Worcester, Mass., and held in the assembly hall of its administration building, Oct. 15 and 16. About 160 delegates from 35 cities attended the sessions.

Among the speakers on the program were: Charles R. Wiers, Larkin Co., Buffalo; E. H. Fish, H. N. Rasely and E. J. Chaffin, Norton Co., Worcester; John F. Tinsley, Crompton & Knowles Loom Works, Worcester; L. A. McQueen, B. F. Goodrich Rubber Co., Akron, Ohio; E. P. Cramer, Goodyear Tire & Rubber Co., Akron; John J. Morgan, John J. Morgan Advertising Co., Boston; Prof. Paul G. Cherrington, Harvard University School of Business Administration; Nelson C. Durand, vice-president Thomas A. Edison, Inc.; and Prof. George B. Hotchkiss, New York University School of Commerce, Accounts and Finance.

Among the many manufacturing companies represented were the following from the metal-working industries: Simonds Mfg. Co., Fitchburg, Mass.; New Jersey Zinc Co., New York City; Stanley Works, New Britain, Conn.; Art Metal Construction Co., Jamestown, N. Y.; Kawneer Mfg. Co., Niles, Mich.; Taft-Pierce Mfg. Co., Woonsocket, R. I.; Bilton Machine Tool Co., Bridgeport, Conn.; Warner & Swasey Co., Cleveland; Chase Rolling Mill Co., Waterbury, Conn.; Locomobile Co. of America, Bridgeport, Conn.; Columbia Steel & Shafting Co., Pittsburgh.

There was such keen interest in the discussions that a committee of five members was appointed to plan for another convention next year at Akron.

The First Heine Boiler Still Fit for Service

The first Heine type boiler ever built was installed in 1881 in one of the armories of the Missouri National Guard at St. Louis. A few months ago the building was destroyed by fire and the boiler was subsequently removed by the Heine Safety Boiler Co. It has 24 tubes about 10 ft. long with a heating surface of approximately 250 sq. ft. The boiler was inspected by one of the boiler insurance companies and as a result a certificate that the boiler could carry a pressure of 80 lb. as compared with its original pressure of 100 lb. was issued. The tubes were pitted and will have to be replaced and the blow-off flange must be renewed. With these exceptions, however, the boiler is in good condition. One of the interesting features is the use of vertical baffling, which has been superseded by the horizontal type in both the land and marine boilers built by the Heine company.

Purchasing Agents Close Meeting

At the closing session of the National Association of Purchasing Agents, held at the William Penn Hotel, Pittsburgh, last week, E. L. McGrew, purchasing agent of the Standard Underground Cable Co., was re-elected president, and L. F. Boffey of New York City was re-elected secretary. Other officers elected were: N. O. Acby, first vice president, Columbus, Ohio; Charles P. Kingston, second vice president, Detroit; William B. Golder, third vice president, Philadelphia; and W. T. Hall, treasurer, New York. After final adjournment, the delegates made a trip of inspection to the plants of the Westinghouse Electric & Mfg. Co., East Pittsburgh. Detroit was chosen for the convention next year.

The district offices of the Concrete Steel Co., formerly located in Youngstown, have been removed to Cleveland. D. S. Bright is district sales manager, and M. H. Stevens has been made manager of the plant at Youngstown.

NEW MILITARY TRUCK TESTED

Remarkable Record Made in Manufacturing Standard Military Truck

WASHINGTON, Oct. 23.—An order for 10,000 standard military trucks has been placed by the War Department. The contract will be scattered throughout the automobile industry of the United States, about 60 plants participating in the making of the different parts. The first test sample of the standard truck was completed at Lima, Ohio, and a second at Rochester, N. Y. They completed their test runs to Washington, D. C., last week. The designing and building of these trucks is considered another war-time achievement by those in charge of this phase of the quartermaster's work.

The designs were started last August with the assistance of the Society of Automotive Engineers. The standard truck only will be supplied to the American army after Jan. 1 next. This means that only 7500 different parts will be carried in stock for repairs by the quartermaster. Because of the varying types of trucks now used by the Allies on the front, a stock of about 2,000,000 different parts is carried in France.

So successful has been the work of standardizing the three-ton truck that the War Department is intending to have the three-quarter ton and the one-and-a-half-ton truck standardized for the use of the army. The two trucks put through their tests this week were both of the class B truck design for a three-ton load, but with capacity for five tons. The assembling of these trucks as well as the designing of them sets a high mark in American production, the first truck having been assembled two days ahead of schedule.

The two trucks that have been assembled have exceeded the expectations of not only Brig. Gen. Chauncey B. Baker of the Quartermaster's Department, who has directed the work, but also of the two score of engineers and hundreds of draftsmen who worked on the design in Washington. Early tests of the engine showed 58 horsepower at 1350 revolutions per minute, and the engine torque curve is better than anticipated. It is felt that the United States heavy-duty war truck will go far to revolutionize army truck work so far as operation and maintenance are concerned, and that the truck will play a large part in affecting truck design in commercial circles.

The speed with which the different makers attacked their respective tasks and completed them is shown by the following:

The Continental Motor Mfg. Co., which was one of the several engine producers participating in the program, received blueprints on Sept. 9, and had an engine running 19 days and 18 hours thereafter, while the Waukesha Motor Co. had its first engine running in eleven days and seven and one-half hours from the time the blueprints reached its factory. These companies did not have to make all the patterns for castings for the dies for forgings, some of these having been made previously, but they had to do most of the machining and other operations on the parts. In developing the engine four or five makers co-operated by distributing the different parts, one making several parts not only for itself but for the other engine makers. In this way time was saved. The Continental company made the cylinders, gearcase cover, and many small parts such as pumps, bushings, etc. The Waukesha company manufactured the cylinder heads, the crankcase, intake and exhaust mainfolds, roller pushrods, etc. The Wisconsin company made the lower part of the crankcase.

The remarkable patriotic response of manufacturers of raw and finished products made possible the completion of the units in record time. As an illustration, the Park Drop Forge Co. worked continuously in three shifts and succeeded in sinking the dies for the crankshaft in seven days, an operation which is rarely completed in peace times in less than three weeks. The Werra Aluminum Castings Co. produced the pattern for the main crankcase and the first casting in five days, this usually taking from three to four weeks on much smaller jobs. The Continental pattern shop completed the pattern for the cylinder pairs in slightly over five days, an accomplishment which can be appreciated only by those who have manufactured engines.

In summarizing the co-operative talent embodied in the engine, it might be said that the crankcase is Continental, the cylinders Waukesha, the oiling system a combination of Wisconsin and Buda, the pistons Hercules, and the timing-gear system a combination of Buda, Wisconsin, and Continental. The governor is a combination of Kelly-Springfield and Waukesha. The camshaft is a composite design. The engine has been designed with the thought of using the heavier fuel, the combustion chamber and other parts having been designed to meet these requirements.

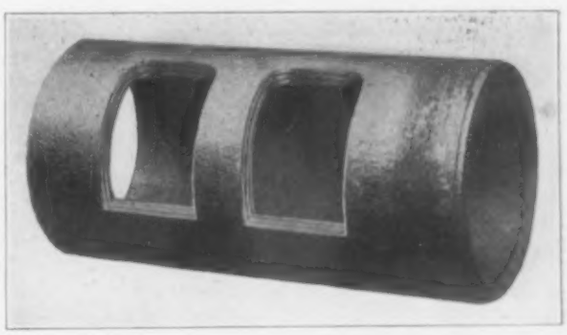
What has been said of the engine can be said of the transmission, the axles, and other parts. Three or four of the leading axle makers have worked together on the axle design. So with the transmission.

So well have all the engineers co-operated that the schedule set for the completion of the different truck units, as well as of the completed truck, has been lived up to and generally improved upon. The first engines built in different factories were to have been delivered on Sept. 30 and they were delivered on that date. The completed chassis was to have been ready Oct. 10 and was ready on Oct. 7.

The Automotive Products Section of the War Industries Board is composed of H. L. Horning, chairman; Brig. Gen. Chauncey M. Baker, officer in charge of army transportation; Coker F. Clarkson, secretary and general manager of the Society of Automotive Engineers; C. W. Stiger, president, Motor and Accessory Manufacturers' Association; Henry R. Sutphen, president, Motor Boat Association; Frank Russell, president, Aircraft Manufacturers' Association, and T. W. Henderson, president, Motorcycle Manufacturers' Association.

An Example of Three-in-One Piping

An interesting example of what wrought pipe will withstand is shown in the accompanying illustration. It appears that in an Ohio gas field a string of 1440 ft.



Three Sections of Well Casing, in Falling 200 Ft., Were Telescoped Without Breaking the Weld

of 8¼ 24-lb. steel casing was let go and the string, weighing something over 34,000 lb., dropped 200 ft. to a bottom of limestone. The three sections on the bottom were telescoped, one inside and the other outside. No failure in the weld could be noted and the three lengths were thus telescoped without a crack. The exterior appeared like merely a straight length of casing. The piece was machined to show the three separate sections as telescoped. The exhibit was obtained from the National Tube Co., Pittsburgh.

Regarding a tungsten deposit at Hatches Creek in the Northern Territory of Australia, the report of the Director of Mines of Australia states that the reefs are numerous, well defined and with considerable persistence in size along the line of outcrop. With the introduction of capital and better transport facilities the field is destined to become an important producer in the future. The British Trade Commissioner in New Zealand reports that an important find of scheelite has been made in the Barewood district. A Dunedin syndicate has secured an option and opened up the reef.

Failure of Boiler Plates in Service*

Investigation Shows Fatigue of the Material to Be the Cause of Cracks in Riveted Joints

BY E. B. WOLFF

THIS research was undertaken with the view of finding the causes of the cracking of boiler plates over the riveted seams. The boilers were of the single-ended ordinary marine type with three flues. The shell plates and the rivets were generally approximately 32 mm. thick, made some from basic and some from acid open-hearth soft steel with an ultimate tensile strength of 42-48 kg. per sq. mm. and an elongation of 23 to 20 per cent in 10 in. The phosphorus and sulphur contents had to be under 0.05 per cent. Most of the boilers with the cracked plates belonged to steamship companies, the boats of which made voyages with a great many stops, so that the fires were frequently extinguished and relighted. Most of them being oil-fired, this could be done very easily. The plates of coal-fired boilers, however, cracked in the same manner. Boilers made of the same material for other companies, the boats of which had only long non-stop runs, did not fail.

The researches were started after one of the boilers had exploded. An investigation showed that the explosion had been caused by the shell plate of the boiler having burst open in the middle of the double butt strap joint at the side. Through the large opening the contents of the boiler had been ejected, destroying the hull of the ship and causing much damage.

After the rupture the shell plate, at the place where it had failed, had a thickness varying from 33 mm., the original dimension, in the middle, to 27.5 and 28 mm. at the sides. As the plates had an equal thickness in all other parts, the only possible explanation of this difference was that the plate had failed by the forming of a crack in the middle of the length of the boiler, this crack having gradually developed to such an extent that the sound part at the sides could not withstand the boiler pressure and failed suddenly, showing a reduction of area only in that sound part. As at the time the direct cause of this disaster could not be ascertained, it was decided to take out of service all boilers made of the same material and at the same time as the burst boiler. It was found that a large part of the shell plate, under the butt strap cover plate, had cracked. The crack could only be detected by taking off the cover plate. From Fig. 1 it can be seen that if the boiler had been kept in service much longer a similar disaster would have followed.

In the years following other boilers, made with every precaution and good workmanship, and of the best material obtainable, also cracked, but not always in the same seam; sometimes the lap joint, joining shell plate and front plate, failed; in other cases both joints developed cracks in some parts.

Description of the Cracks

All the cracks found are, in the beginning, defects of microscopical dimensions. It would occur that a boiler, the side seam of which had failed, would be sent back to the boiler-shop to be fitted with a new shell plate. After detaching the front plates, nothing abnormal would be seen, and it would be decided to make use of the old front plates and fit new shell plates to them. The shell plates were bent with great care to the radius of the front plates and bored in position. When the first rivet, joining the front and shell plates, was put in, cracks appeared in some of the old rivet-holes of the front plate. By a renewed examination of the other rivet-holes, after cleaning the metal by scraping it carefully and later etching it, minute cracks were detected. The etching of the front plate, in the manner presently to be described, disclosed a great many miniature cracks.

The cracks were found in the butt joints as well as in the lap joints, but in all cases they started either from the inside of the holes, in two places, where the highest tensile stress occurred, or at the surfaces of the plates where they were pressed on the surfaces of other plates. Fig. 2 gives a view of the peculiar form of these cracks. Where they are found in the rivet-holes of the plates, they occur generally on two sides of the holes; in the case of the pipe-holes of the tubular boiler they spread from the top of the hole inward. When they occur on the surface of the plate, it is generally around the rivet-holes.

The cracks start as miniature surface cracks of microscopical dimensions. Every little crack has been formed by itself, without the slightest reference to its neighbors. A polished and etched section through these cracks shows that the crystallites in the immediate neighborhood have not been deformed. The structure of the material has in most of the cases been found quite normal, no free cementite being present. Afterward the cracks grow in length and depth, and unite in longer ones, forming a peculiar stepped line.

All evidence points to a peculiar form of destruction of the surface layers of otherwise very plastic metal. As the cracks always started at the surface of the metals and in the holes over the entire thickness of the plate, phosphorus or sulphur segregations, if these had occurred, could have had no influence. No segregations of importance were, however, found in most of the cracked plates. At first it was thought that the deformation of the material in the rivet-holes made by the boring of these holes might have had a great influence. As it was not possible to produce similar cracks in holes that were bored with a blunt drill, and as pieces cut out of such a hole and bent open, till the deformed surface broke, showed sufficient deformation before breaking, it was concluded that if the deformation had been one of the causes, it could only have been a secondary one. As hand-riveted joints cracked in exactly the same manner as joints where the rivets had been pressed in by the hydraulic riveting machine, the pressure of this machine on the plate also cannot be the cause of the cracking.

Fatigue As a Cause

The only phenomenon known, where cracks of the kind described have been observed in plastic material, is that known as fatigue. The researches of Ewing and Humfrey have disclosed the mechanism of the formation of these very local hair-cracks in plastic metal. A case of the formation of similar cracks in a large shaft, where overloading in service could be proved, showed the same kind of cracks after etching with diluted sulphuric acid. Fig. 3 shows that the

Fig. 1—Cracks in a Boiler Revealed After the Cover Plate Was Removed

*From a paper presented at the annual meeting of the Iron and Steel Institute, London, Sept. 20.

crystallites in the immediate neighborhood of the crack were not deformed. This was also the case with the boiler-plate cracks.

It may be observed, in the first place, that the ships with boilers that have cracked made relatively short voyages along the coast, and that in the beginning no care was taken to avoid changes in the steam pressure. When later care was taken to maintain the steam at a regular pressure, the cracking diminished. The first boilers were oil-fired, and were made of basic open-hearth material; afterward boilers both oil and coal-fired made of first-quality Scotch acid steel cracked in the same manner. Notwithstanding the severe conditions of the service, the number of the alternations is, however, only few, when compared with that required to produce ordinary fatigue breaks. Only when it can be proved that at the places where the cracks are found, abnormally high stresses can occur, may we accept fatigue as the cause of these cracks.

From the theory of Kirsch and Leon, and the tests by Preuss, the tension at the edges of a hole in a bar loaded in the direction of its axis may amount to three times the average tension calculated for that bar. If the holes of a riveted joint can behave as in ordinary bars, we have an explanation for the fact that the tensions at the edges of the holes can reach a very high value. The average tensional stress in the cracked plates was approximately 11 kg. per sq. mm. When this value is trebled, we reach such a high stress in these places that very few alternations will suffice to cause a crack.

With a view of proving that the friction between

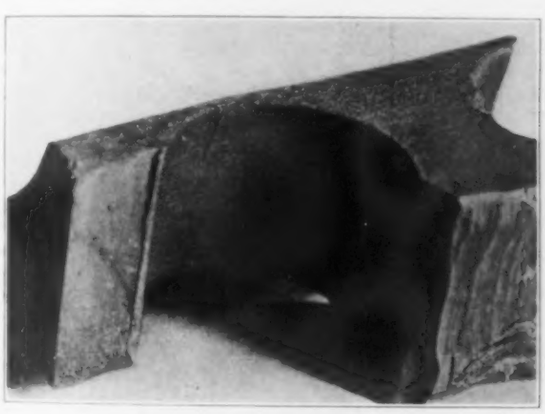


Fig. 2—Cracks in the Waterdrum of a Tubular Boiler of the Yarrow Marine Type. The distance of the holes for the pipes to the edge of the thicker part of the shell had been made too small; after some years of service cracks appeared at the outer surface. After taking the tubes out and etching the holes, miniature cracks did appear even in holes that had seemed faultless

the plates will not be sufficient to counteract the deformation of the sides of the holes, and in order to learn the values of the local stretch in different places of the surfaces of the plates that are pressed against each other, the author has made use of a special type of extensometer, designed by Mr. Okhuizen.

[The original paper gives details of the design of this extensometer and of the tests.]

Conclusions

The investigation proved that peculiar kinds of cracks occur in riveted joints of all kinds of boilers in service. These cracks are in most cases invisible in the beginning and can then only be observed after etching the plates. They are found either on the inner surfaces of the rivet-holes or on the surfaces of the plates where these are pressed together. They are found in lap joints as well as in butt-strap joints, in shell and front plates as well as in firebox plates. The real stresses in different place of the riveted joints have been measured by a special extensometer (Okhuizen), and it has been proved that the supposition that these cracks have been caused by fatigue of the material is probably right. The real stresses that occur in boilers can be even much higher than those in a test-piece.

P. D. Merica, in *Metallurgical and Chemical Engineering*, May, 1917, has published the results of an investigation on the embrittling action of sodium hydroxide on mild steel and its possible relation to seam failures of boiler plate. The conclusion drawn is that the influence of alkali on steel can be detected principally by means of the alternate bending test, the number of alternations being some 20 per cent lower for the metal treated by the alkali than the values for the untreated metal. A recovery of the material occurs after a week's time of treatment at the temperature of 180 deg. C.

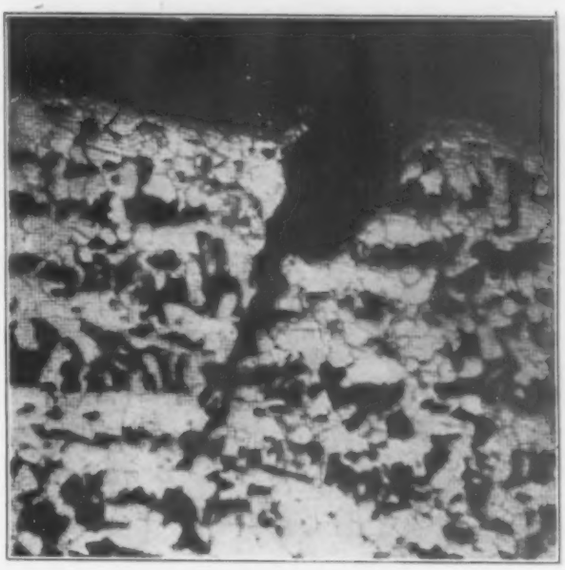


Fig. 3—One of the Cracks in a Shaft. The crystallites have not been deformed. Magnification is a slight reduction from 80 diameters

The same kind of cracks mentioned in the present paper were found by Mr. Merica in different kinds of boilers. The cracks described by me have occurred not only in the water-space but also in the steam space of boilers. Being extremely local, in most cases no leakage was observed and no boiler scale was found between the plates. Since the boilers crack after having been in service for one or more years, recovery of the material from the effect of the alkali, mentioned by the author, should have taken place long before the cracks started.

Commenting on Dr. Wolff's paper, the London *Times* says: It is a fortunate circumstance that in spite of the large number of marine boilers in service, roughly estimated by J. T. Milton, engineer surveyor of Lloyd's Register, at 50,000, and although these are of all ages, the case described in the paper is practically the only instance on record of a marine boiler bursting with disastrous effect while in service. Mr. Milton himself knows of no other case, and C. B. Stromeyer, another authority, who was formerly an official of Lloyd's Register, was able to confirm the statement. A point raised in the discussion referred to the fact that the plates of the boiler which exploded were probably of basic steel, whereas acid steel has been almost invariably employed for boiler plates, at least until recent years; and it was hinted that failures which have occurred in shell plating may be the result of using steel made by the basic process. The probable cause assigned for the failure of the boiler plate which was the subject of discussion was the fact that in Continental practice boiler plates are annealed, and that by reason of the custom of annealing them in batches those in the middle of a batch so treated are subject to uneven heating, which leads to the development of defects that may cause failure in service. This view is to a certain extent confirmed by the fact that the trouble experienced with boiler plates is invariably round the edges, which are the part of the plate which would tend to be overheated by the annealing methods adopted; but it is the fact that plates which have not been subjected to annealing have failed in the same way.

WAR PROBLEMS DISCUSSED

Agricultural Implement Manufacturers' Convention—Co-operating with the Government

Many problems which the war has interjected in their business were considered by the manufacturers composing the National Implement and Vehicle Association at the twenty-fourth annual convention held in Chicago, Oct. 17 to 19. Especial emphasis was laid on the steps which had been taken to secure priority in the delivery of raw material to the agricultural implement industry, the action taken resulting in that industry being the first to arrive at a practical arrangement for close co-operation with the Government. Early in the situation, the executive committee of the association appointed a War Emergency Committee consisting of C. S. Brantingham, chairman; G. N. Peek, George A. Ranney, W. H. Stackhouse and H. M. Wallis. Further developments are described in the report of the committee as follows:

Method of Obtaining Priority

To obtain priority for this industry, the Government and your executive committee have appointed the members of your war emergency committee as a special committee, to be known as the Farm Implements Committee, this in compliance with the War Industries Board's request to deal with the Government Priority Committee on all questions of priority affecting the members of this association, as well as non-members in this industry.

This special farm implements committee has prepared blanks which have been approved by the Priority Committee. Copies of these blanks will be sent to the membership. These blanks call for certain information required by the War Industries Board, which must be furnished before priority certificates will be issued by the War Industries Board. Each case must be presented separately and passed on separately by the Priority Committee. The Priority Committee has requested that one person be designated as Washington representative, with whom it may deal as cases arise. It is, therefore, highly important that the membership cordially co-operate with this farm implements committee and thereby permit it to be of the greatest possible help to the industry, as well as to the individual members seeking priority for their orders.

The retiring president, Joseph Dain, Deere & Co., Moline, Ill., referring to priority and the farm implements committee, in his address, said:

Let me request not only the members of our association, but all of the manufacturers of implements throughout the country, to readily and heartily respond to all requests for information which may come from this committee or any priority committee that may have Government sanction. The information so furnished will be absolutely essential for the protection of the industry in its supply of raw materials, and absolutely necessary to the Government if it makes a limited supply of materials cover the greatest possible field. The association is going to great expense in handling these priority matters, and is entitled to the heartiest co-operation upon the part of all manufacturers in our line.

Discussion of Vital Topics

Thursday, the second day of the convention, was termed war emergency day, the topics being those vital to the present situation. C. S. Brantingham, reporting for the War Emergency Committee, said that no industry as a whole could be placed in priority class A or B, and that the Priority Board at Washington could only recognize a committee which represented the entire industry. Only specific orders are classified. Therefore, if the association were to help a non-member, it is necessary that the latter's inquiries should flow through the Farm Implements Committee. He stated that the suppliers of material are doing their best for the industry, but that they are co-operating with the Government and conforming with the Government's priority provisions. The Farm Implements Committee is purely advisory in its relations with the Priority Board, but it was reassuring that members of the board had personally, though not officially, stated that they regarded the implement industry as an essential to the conduct of the war.

George A. Ranney, International Harvester Co., Chicago, discussing the effect of the war on material deliveries and prices, gave the opinion that when present materials contracts expire, or by Jan. 1, the effect of the Government's action on prices will be felt; meanwhile buyers must be patient. He endeavored to give the convention a sense of the huge amount of money which the Government has appropriated—some $21,000,000,000—and emphasized the fact that it will largely be spent in promoting industrial activity and in procuring raw materials, one result of which will be that some industries will have to go without all the material they desire. He urged conservatism in exercising priority privileges, and said that for a manufacturer to ask for 1000 tons when he actually needed but 500 tons would tend to discredit the association and the industry it represents. He also said that the tremendous movement of materials and men by rail promised to create a great congestion in freight.

George N. Peek, Deere & Co., Moline, spoke on cost standardization and labor. He said that while it was understood that material prices would be revised Jan. 1, not one knew whether they would be revised up or down, and that no one cared to speculate. The determination of accurate costs was pronounced most necessary, said Mr. Peek, for the reason that the Government has the power to do about as it pleases with the agricultural implement industry. It remains to be seen whether the Government will exercise that power, but if it does, the industry must be in a position to give accurate costs. He said, also, that the manufacture of unnecessary machines, some of which could be described as whims, should be eliminated. He expressed the opinion that it was largely the continual turnover of labor in manufacturing plants that makes high labor costs, and that not enough attention is paid to seeing that every new man makes good, not only for his employer, but for himself; in other words, that he gets the wages he should get, in which event he would be more likely to remain satisfied.

Makes Plea for the Railroads

W. H. Stackhouse, French & Hecht, Springfield, Ohio, made a plea for the railroads in discussing transportation. He believed they should be accorded substantial increases in freight rates, and said that the depreciation of railroad equipment is a problem which must be met directly and without evasion. Recent methods of augmenting the service of the railroads, the speaker said, showed the wisdom of pooling arrangements and the hypocrisy of law, inasmuch as the railroads are now pooling with the connivance of the Federal Government. He also urged Federal incorporation and regulation of railroad securities, not with a view of depriving the individual States of their right to tax railroad property and impose police regulations, but to enable the roads to escape from a multiplicity of masters and an excessive number of laws. He said the most marked result of the present regulation will be the nationalization, to a large extent, of the railroads of the country.

Officers Elected for 1918

At the closing session of the convention, officers for 1918 were elected as follows: President, C. S. Brantingham, Emerson-Brantingham Co., Rockford, Ill.; chairman executive committee, G. A. Ranney, International Harvester Co., Chicago, Ill. Members executive committee: H. M. Wallis, J. I. Case Plow Works, Racine, Wis.; Wm. Black, B. F. Avery & Sons, Louisville, Ky.; F. G. Allen, Moline Plow Co., Moline, Ill.; R. V. Board, Kentucky Wagon Co., Louisville, Ky.; Willard Z. Carr, American Seeding Machine Co., Richmond, Ind.

Vice-presidents: Danforth Geer, W. A. Wood M. & R. M. Co., Hoosick Falls, N. Y.; J. D. Oliver, Oliver Chilled Plow Works, South Bend, Ind.; A. M. Ford, Geneva Metal Wheel Co., Geneva, Ohio; S. S. Davis, Rock Island Plow Co., Rock Island, Ill.; H. F. Yergey, Columbia Wagon Co., Columbia, Pa.; W. W. Miller, Miller Wagon Co., Edina, Mo.; Geo. A. Yule, Baine Wagon Co., Kenosha, Wis.; H. C. Hargrave, Des Moines Silo & Mfg. Co., Des Moines, Iowa; W. B. Moyer, Moyer Mfg. Co., Montevideo, Minn.; W. J. Irons, Cushman Motor Works, Lincoln, Neb.; Chas. G. Rowley, Aspinwall Mfg. Co., Jackson, Mich.; S. C. Harlan, Florence Wagon Co., Florence, Ala.

Japanese Will Aid Chinese Enterprise

Announcement of a co-operative project between Chinese and Japanese capital to develop China's largest iron and steel enterprises has been made by Keiichiro Yasukawa, says *The Far Eastern Review*. He states that a company has been formed with $5,000,000 capital, one-half of which is subscribed by Chinese and the other half by himself, the Chinese parties interested being in control of the Hanyehping Works. The new company has entered into a contract with the Hanyehping company to furnish a large fixed amount of pig iron which will be transported to Japan, where the new company will put up large steel works at Kurosaki, a small town on Hakata Bay, in Kyushu. Mr. Yasukawa is one of the biggest figures in Japan's mining industry. Of late he has extended the scope of his enterprises, embracing many other lines, including banking. At his own expense he has established a technical college at Tobata, Fukuoka prefecture. He is also a member of parliament. Originally his plan was to manufacture steel in China and export it to Japan. The duty on steel, however, is $5 a ton, while on pig iron it is but $0.70 a ton. For this reason it was decided to manufacture in Japan.

In the first week of October, 1916, a provisional contract was signed between the Hanyehping shareholders and Mr. Yasukawa. On the basis of this provisional agreement, a new company was planned under the name of the Kyushu Steel Works, a joint enterprise with a capital of $5,000,000, equally divided between Chinese and Japanese. The promoters planned to start work at once on the new plant, but delay was due to protracted negotiations with the Imperial Japanese Government Steel Works over the proportional share of pig iron to be delivered. The amount of pig iron which it is planned to produce is between 450,000 and 500,000 tons. The Kyushu Steel Works will obtain, with the consent of the Government Works, a supply of 60,000 tons per year.

Discussion of Papers at Institute Meeting in Cincinnati

Patriotism is to be the keynote of the meeting of the American Iron and Steel Institute to be held in Cincinnati on Friday of this week. The paper by S. S. Wales, electrical engineer Carnegie Steel Co., on "Recent Installations of Large Electric Motors in Rolling Mills," will be discussed by Wilfred Sykes, Westinghouse Electric & Mfg. Co., Pittsburgh, and David B. Rushmore, General Electric Co., Schenectady, N. Y. The paper by Henry F. Pope, president National Malleable Castings Co., Cleveland, on "Malleable Iron and Its Uses," will be discussed by F. E. Nulsen, Missouri Malleable Iron Co., East St. Louis, Ill.; Prof. Enrique Touceda, Rensselaer Polytechnic Institute, Troy, N. Y.; Frank Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh, and J. S. Haswell, Dayton Malleable Iron Co., Dayton, Ohio. The paper by Eugene P. Thomas, president United States Steel Products Co., New York, will be on "Export Trade as Affected by the War." It will not be discussed nor will the paper by Joseph G. Butler, Jr., Youngstown, on "Fifty Years of Iron and Steel." Chairman John A. Topping of the Republic Iron & Steel Co. will discuss the paper by W. Vernon Phillips, Philadelphia, on "Iron and Steel Scrap."

At the banquet to be held Friday evening at the Hotel Sinton, there will be numerous short speeches and other interesting features.

It is announced that employees of the Bellaire blast furnaces and steel works of the Carnegie Steel Co., at Bellaire, Ohio, will be furnished with coal this winter at 8c. per bushel. It is said that local dealers are now asking 16c. per bushel.

Several northern Ohio cities have received communications from the National Machinery & Supply Co., Hamilton, Ont., which is seeking a location for a new plant. A building with 75,000 sq. ft. of floor space is desired.

A New 13-in. Geared Lathe for Toolrooms

A 13-in. lathe which can be used either for precision work in the toolroom or for manufacturing where accurate work is required has been brought out by the Master Machine Tool Co., 110 West Fortieth Street, New York. The headstock spindle has a wide range of speeds, from 28 to 418 r.p.m., in six steps, and is driven by a positive clutch. These changes are secured by a lever and handwheel conveniently situated on the headstock.

The bed has two wide V and two flat bearing surfaces reinforced by cross braces which are relied upon to reduce the amount of vibration. The lead screw, which is splined, is located directly under the guides, this arrangement being relied upon to provide a steady motion for the carriage. The spindle, which has a hole 1 1/16 in. in diameter throughout its entire length and is arranged for draw-in attachments and collets, is driven by a positive clutch. The bearings are of phosphor bronze and the large end of the spindle has a thread and shoulder for chucks and faceplates. Quickly adjustable collars are provided for taking up wear and a ball thrust bearing is provided to reduce the amount of end thrust.

A Positive Clutch Drives the Headstock Spindle in a New 13-In. Toolroom Lathe at Speeds ranging from 28 to 418 r.p.m.

The apron is of the standard double plate type and the rear one is detachable, to facilitate the removal of all parts for repair or inspection. The lead screw is splined for driving the worm which operates both the automatic longitudinal and cross feeds through a friction clutch. A safety lever is relied upon to prevent the engagement of the split nut with the lead screw while either feed is in use. The thread on the screw is employed only when screw threads are being cut, thus prolonging the life of the screw. A four-change feedbox is provided to house the steel gears. It is possible to secure any feed practically instantaneously from the roughing to the finishing cut. Threads ranging from 1¼ to 80 per in. can be cut by manipulating the gears in the feedbox, the proper position of the controlling levers being indicated on the gear plates.

The tailstock has a spindle 1⅜ in. in diameter and is provided with a side attachment for turning tapers. A special nut on the outer end of the tailstock holds the tailstock screw in place, and by unscrewing the nut it is possible to remove the entire screw easily.

The regular driving arrangement is from a reversing countershaft through a single pulley, but if desired a motor-driven tool with an adjustable chain drive and positive reversing mechanism in the headstock can be provided, or a special type of electrical reversing mechanism can be supplied which eliminates the controller generally employed.

The blast furnace of the Oriskany Ore & Iron Corporation, Lynchburg, Va., has been making ferromanganese since Oct. 6. John S. Kennedy has been general manager of the company since last June.

A RISING ALABAMA CITY

Advantages of Sheffield as a Producing and Shipping Point Becoming Recognized

THE decision of the Government's board of experts to locate the experimental nitrate plant at Sheffield, Ala., within a dozen miles of the Mussel Shoals, on the Tennessee River, together with the rehabilitation of the Cole furnaces by the newly organized Sheffield Iron Corporation, gives to this Southern city rather more than a local interest. It is already something of an iron center, through the operations of the Sloss-Sheffield Steel & Iron Co., and its facilities for water transportation in connection with that industry, as noted in THE IRON AGE, Aug. 16, 1917, should lend to this location an added importance.

Sheffield is a town of about 5000 population and was started at about the same time that witnessed the booming of Birmingham. It lies between the two older towns of Tuscumbia, on the west, which is about two miles away, and Florence, on the east, across the Tennessee River, and about five or six miles removed. This close proximity to the two older towns would seem to circumscribe Sheffield in certain minor matters, but it calls for no very great stretch of the imagination to picture all three of them grown together at no distant day, which was more than likely the dream of its founders. As a matter of fact, a residence in Sheffield gives to its people many of the advantages of the neighboring communities, all of which are connected with a satisfactory trolley service.

The nitrate plant will use between 500 and 600 acres of land, all of which has been provided, and it is current gossip that some of the machinery is now on the way, while within another week it is said that the building operations will be started.

Transportation Advantages

It is difficult to account for the very much greater growth of Birmingham than that which came to Sheffield, except upon the ground that Birmingham had a larger number of railroads and that her iron manufacturers had not so far to go for their ore and coal. Railroads will go, however, to where the business is; and when one reflects that Pittsburgh makes iron from Lake ores, and Chicago makes its iron with coke from Pennsylvania and West Virginia, the conclusion must be that Sheffield is not severely handicapped for her stock, going to Russelville, about 20 miles, for ore, and to Jasper, about 80 miles, for coal.

There is one thing about water transportation that cannot have penetrated the minds of many of the large shippers, and that is that a steamboat capable of handling a dozen barges of iron or coal can be launched and equipped for less than the present price of a first-class locomotive.

Within a few months a prominent manufacturer of pig iron in the Birmingham district, employing some 30 locomotives between its mines and furnaces, wanted an engine of certain specifications and wrote to a number of makers for their prices. The lowest price that the purchasing agent was able to get was so high, he said, that he dictated a letter to the effect that no engine on earth could be worth such money, and he would never pay such a price, but before the letter was mailed he received a wire withdrawing the quotation. Naturally, the cost of building boats has also advanced in recent years, but timber can still be had in certain sections at reasonable prices, and a small steamboat can be made to handle a number of very large barges.

Perhaps the best comment upon Sheffield as a center for large manufacturing plants was recently made by the president of one of its large enterprises, who, on a visit from New York, remarked that the place was steadily growing in his estimation; that the more he considered it the better it seemed. The climate, the natural resources, the negro labor and the shipping facilities all conspire to effect a low cost of production, and with a navigable river the whole year the markets of the world are at Sheffield's gates. E. M.

STEEL PLANT SAFETY

Accident Statistics—Other Industries—Youngstown Sheet & Tube Co.

IN a paper presented before the National Safety Council at its annual meeting in New York, Sept. 14, D. R. Kennedy, assistant to the president, Youngstown Sheet & Tube Co., Youngstown, Ohio, gave accident statistics which, he said, were compiled from data presented by 23 concerns employing over one-half million men and representing, besides the steel industry, other large industries which have shown exceptional growth under the conditions brought about by the war and, therefore, in his estimation exemplify the worst phase of the safety situation. A review of his paper follows.

It is almost the universal experience that accidents started to increase early in 1914, reached their peak in 1916, and receded rather sharply in the first half of 1917, in spite of the fact that the employment roll of the industries involved is still mounting in the same or more pronounced proportion. However, not until some time in 1916 did organization for increased production become efficiently developed. While new men were arriving literally by train loads, and were more or less unfamiliar with the new type of employment, safety departments were lost in the maze of new construction and it was not surprising that the accident rate mounted rapidly and steadily. That the new man problem had much to do with the situation is shown in Vol. 4, No. 2, of the Bulletin of the Pennsylvania Department of Labor, by a chart of the Cambria Steel Co., showing that the liability to injury of the new man of less than 30 days' employment was six to one as against a man of 30 or more days' experience.

The table following shows the accident frequency rates per 100 employees for seven large iron and steel plants: the Commonwealth Steel Co., the American Rolling Mill Co., the American Steel Foundries, the Republic Iron & Steel Co., the Inland Steel Co., a subsidiary plant of the United States Steel Corporation, and the Youngstown Sheet & Tube Co.

Frequency Rates of Iron and Steel Plants

Total Number Employed	Year	Total Injured	Rate per 100
24,802	1914	7,445	30.0
26,740	1915	8,157	34.2
37,049	1916	12,951	34.9
45,945	1917	13,104	28.5

Comparable data were also furnished by the Ford Motor Co., the Eastman Kodak Co., the Raritan Copper Works, the Winchester Repeating Arms Co., the Goodyear Tire & Rubber Co., the Republic Rubber Co., the Omaha Gas Co., the Scovill Mfg. Co., the International Harvester Co., and Fairbanks, Morse & Co., as follows:

Frequency Rates of Other Than Steel Plants

Total Number Employed	Year	Total Injured	Rate per 100
58,240	1914	13,124	22.5
71,005	1915	20,789	29.2
95,902	1916	31,635	32.9
136,999	1917	29,315	21.3

The tables show that in both groups there was an increase in the accident frequency rate in 1915, and that it reached its peak in 1916. In 1917 the rate decreased. The reports received show that this tendency has been the common experience of nearly every plant. One or two plants reported a drop in 1916. None of the 23 companies shows an increase in 1917.

Statistics of the Youngstown Sheet & Tube Co.

The accident experience of the Youngstown Sheet & Tube Co. the last four years has been similar to that of the other seven iron and steel plants studied. The following table shows the rate of off-time accidents per 100 employees since 1913, and also the average number of days off for each off-time accident.

Off-Time Accidents Youngstown Sheet & Tube Co.

	1913	1914	1915	1916	1917
Rate of accidents per 100 employees	28.9	33.1	30.2	37.6	28.8
Average number of days lost	12.8	13.4	12.3	14.9	13.3

The original statistics which furnished the basis for these rates follow. They show the importance of the new man problem. The increase in the number employed has been: 1914 to 1915, 852; 1915 to 1916, 1500, and 1916 to 1917, 2500 men.

Original Statistics Youngstown Sheet & Tube Co.

	1913	1914	1915	1916	1917
Number employed	7,963	5,648	6,500	8,000	10,500
Off-time accidents	2,302	1,690	1,804	2,669	2,732
Days lost	29,432	22,715	22,300	39,256	36,472

Rates of accidents per 100 men employed for the first six months of 1916 and 1917 give additional emphasis to my point, that accidents have decreased in 1917. These rates include all accidents and not merely off-time injuries. They are, Mr. Kennedy believes, a true representation of conditions in the iron and steel industry, and also quite accurately represent the experience of the other manufacturing establishments furnishing data for this study.

Total Accidents per 100 Employees, by Months, of Youngstown Sheet & Tube Co.

Year	Jan.	Feb.	Mar.	Apr.	May	June
1915	17.9	21.0	22.8	25.3	23.7	24.1
1916	28.0	23.6	25.7	27.7	24.0	21.3
1917	17.0	15.5	18.3	17.3	19.5	18.2

Average Time Lost Per Accident

The following table shows the actual number of off-time accidents by years, also the number of working days lost on account of accidents, and the average yearly number of employees as furnished by the following seven plants; the Commonwealth Steel Co., the American Steel Foundries, the Youngstown Sheet & Tube Co., a subsidiary of the United States Steel Corporation, Fairbanks, Morse & Co., the Corn Products Refining Co., and the Republic Rubber Co.

Off-Time Accidents of Various Plants

	1914	1915	1916	1917
Total off-time accidents	9,309	10,325	16,734	17,622
Total days lost	59,881	55,956	122,401	116,060
Total employed	20,497	21,095	28,605	37,368

The foregoing figures further support the facts already presented, showing the tendency in industrial accident rates since 1914. All evidence thus far has shown that the peak was reached in 1916. Whether accident rates will continue to fall off as they have done in 1917 is hard to state, and as these charts have been prepared to show existing facts nothing by way of prophecy has been attempted.

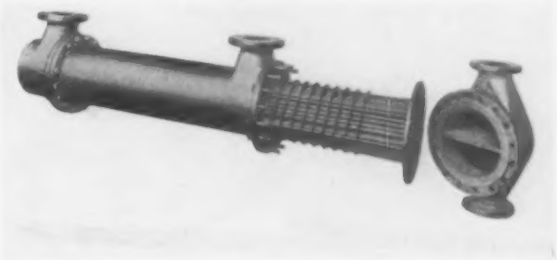
Data concerning the severity of work accidents during the period under study were obtained from a subsidiary of the United States Steel Corporation, the American Steel Foundries, Fairbanks, Morse & Co. the Corn Products Refining Co., the Youngstown Sheet & Tube Co., the Republic Rubber Co., and the Commonwealth Steel Co. The total number of working days lost in any year was divided by the total number of off-time accidents of that year. This gave the average length of time lost for one off-time accident for each of the four years as follows: 1914, 6.4 days; 1915, 5.4 days; 1916, 7.3 days, and 1917, 6.5. These figures show that the severity of accidents in 1917 has decreased, when compared to that of 1916.

About 12,000 tons of manganese ore has been shipped from Panama to the United States since the opening of the Mandinga mines by an American syndicate early in 1916, says U. S. Consul Julius D. Dreher of Colon. It is not expected, he reports, that any considerable quantity of ore will be mined in the future. The statistics in his report show manganese ore exports in 1916 to have been 9935 tons, valued at $328,684, with none exported in 1915.

Quenching and Lubricating Oil Cooler

For cooling the oil used in connection with quenching tanks the Griscom-Russell Co., 90 West Street, New York, has developed a special form of cooling apparatus. The features of the design of the cooler include the use of a number of tubes which form a compact bundle and a special form of helical baffle. Another application of the apparatus is for reducing the temperature of oil that has been employed for the lubrication of turbine bearings, reduction gears, etc.

The oil from the quenching tanks circulates continuously around the bundle of tubes through which the cooling water flows. In this way, it is pointed out, the temperature of the oil is constantly maintained at the desired point. The tubes are of seamless drawn copper and are expanded into the tube sheets at either end of the cooler. In this way the entire tube bundle can be removed as shown, thus facilitating inspection and cleaning. Other points upon which special emphasis are laid in connection with this construction are



The Oil Employed in Connection with Quenching Tanks Circulates Continuously around the Nest of Tubes through Which Water Flows and Is thus Kept at a Constant Temperature

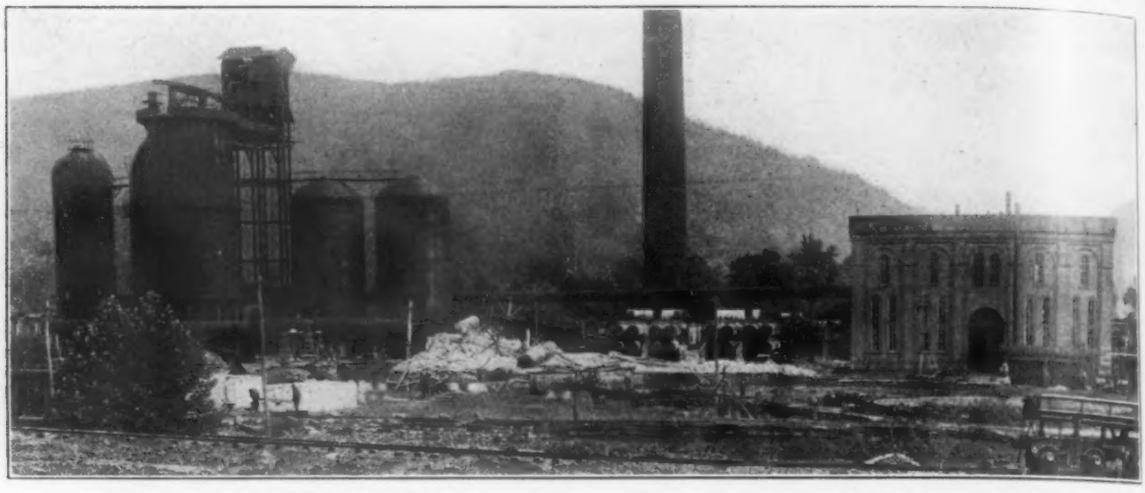
a high rate of heat transfer, thus giving a compact unit that occupies but a small amount of floor space, and the elimination of internal joints and the removal of any likelihood of water leaking into the oil.

In operation the oil passes through the shell and a special helical baffle brings it into intimate contact with the cooling surface. It is emphasized that this type of baffle which gives the cooler the name of Multi-whirl insures a long, smooth path of flow for the oil with a small drop in the pressure.

The iron-mining interests of South Russia have approached the Ministry of Commerce and Industry with a memorial setting forth that, owing to the lessened activity of the metallurgical industries, they have been accumulating an unsalable surplus of iron ores, according to U. S. Consul David B. MacGowan of Moscow. It is estimated that on July 14 they had available ores sufficient for nearly six months of normal operation. The Krivoi-Rog mines are producing upward of 90,000 net tons a month more than the furnaces require. If the mines continue through the year at their present rate of production, the ore reserves will have attained almost 2,400,000 tons. Naturally the iron-mining interests are feeling the burden of obligatory production at a high rate, with so much of their capital invested in surplus ores. This investment, at the present rate of progress, will have amounted by the end of the year to upward of 15,000,000 rubles. (At the time this report was written, July, 1917, the ruble was quoted at 21c. to 22c.) The cost of production increased from 1.755 rubles per net ton in March, 1914, to 2.79 rubles in April, 1917. Upon the introduction of the wage scales that the mine owners have agreed to, the cost of production will amount to 4.59 rubles per ton, and if all the demands of the operatives should be granted they would amount to 7.56 rubles.

Hannah blast furnace of the Republic Iron & Steel Co., at Youngstown, was blown out last week for relining and repairs. W. B. Pollock & Co., of Youngstown, will do the work. The furnace has a daily capacity of about 350 tons.

Goshen Furnace in June



How Goshen Furnace Was Remodeled

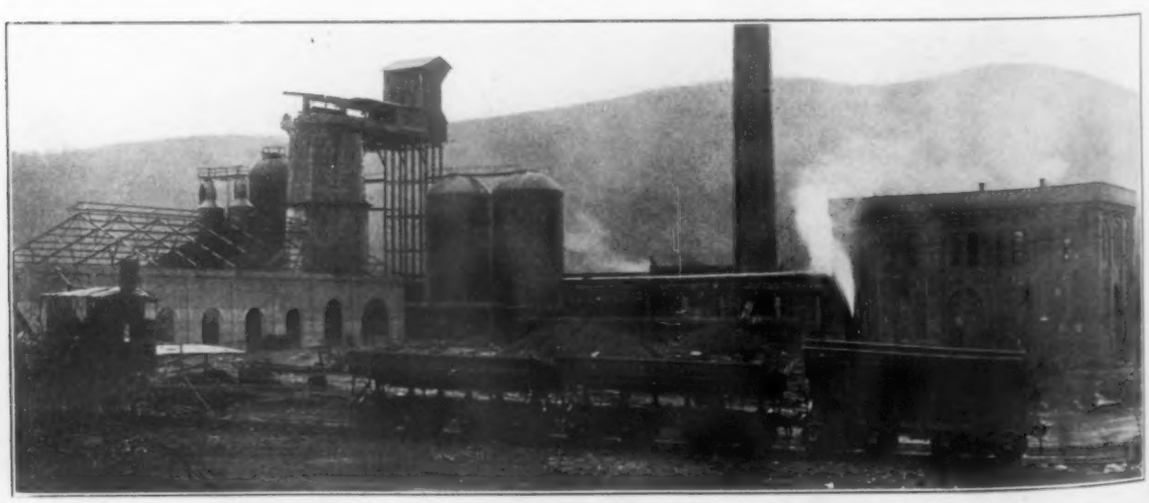
Undertaking Included Attention to Housing and Sanitation — Accomplished in Four Months by Unique Expedients—To Make Ferromanganese

AFTER extensive repairs, replacements and additions, made under trying conditions, the Goshen furnace of the Southeastern Iron Co., Goshen, Va., was blown in Oct. 8. Its production of iron is about 250 tons per day, but it will shortly go on ferromanganese, its capacity for the latter being about 75 tons per day. The furnace was acquired last May from the Goshen Furnace Co. by the Southeastern Iron Corporation, Tower Building, Chicago. It was originally known as the Victoria furnace, having been erected in 1882, and its last campaign, after rebuilding in 1902, terminated in December, 1910, when it was blown out.

The work of rebuilding, now practically completed, was handled by Freyn & Co., engineers, Peoples Gas Building, Chicago, who started work as general contractors in full charge about June 4. The furnace was ready for operation Oct. 5. Considering the difficulties encountered in securing adequate labor and prompt delivery of material and the housing and sanitation problems which were overcome, it is probable that the work accomplished in four months establishes a record for such performances. In the past seven years the majority of the former employees of the plant drifted away, and before labor could be induced to return it was necessary to do considerable repair work on the 80 dwelling houses owned by the company. In fact, the work was essential to afford accommodations for the new organization. The houses were redecorated and refurnished, as well as repaired, and one which was suitable for the purpose was fitted up as a club house for the employees. Provisions are being made for a moving picture theater, reading rooms, hospital, etc. To provide pure water 16 wells were drilled on the property and extensive provisions carried out for the sanitation of the dwellings and the plant itself. Old sewers were repaired and new ones added. As a precaution against typhoid all of the employees were inoculated. The local health officer said there was abundant justification for these measures.

Details of Repairs to Furnace

The construction work on the furnace plant proper included relining the existing stack in hearth



Goshen Furnace, Oct 14

and bosh. The dimensions of the furnace follow: Hearth diameter, 11 ft. 6 in.; bosh diameter, 18 ft. 6 in.; stock line, 13 ft., and height of furnace, 75 ft. The steel work required considerable patching, especially on the furnace shell and the bosh jacket, while the downcomer elbow was entirely replaced. The hearth and the bosh cooling arrangement was completely remodeled and provision made for cooling the stack by water sprays in view of the furnace being intended for the production of ferromanganese. Extensive repairs were made to the blast furnace top, the hoist engine and double vertical elevator. It is the intention, later on, to install a modern closed top and skip incline.

The cast house was rebuilt, and a Brassert gas washing unit was added to clean the stove gas, and later on the boiler gas. The unit was constructed by Hibben & Co., Chicago. The bell and hopper extension was protected by the Ives method of heat insulation. The four hot blast stoves were in good condition, although requiring some patchwork and repairs of the brick work. Three of the stoves have linings with 4½-in. checkers, and the total heating surface is sufficient to secure heats of 1500 deg. Fahr.

Old Locomotive Supplied Steam

The old tubular boilers were dismantled and replaced by six 400-hp. Babcock & Wilcox boilers, arranged for gas and coal firing. The early need for steam for construction purposes was met by utilizing an old and defective locomotive, the running days of which were over, but which still could produce steam. It was placed on a side track and supplied power for various purposes, including the operation of a turbo-generator by means of which the plant was lighted at night, thereby facilitating 24-hr. operations in the last few weeks of the undertaking. Previous to the arrival of the generator work was carried on by the light of torches. Another expedient was to fasten to a tree a Westinghouse air compressor of the locomotive type, the steam for which came from the old locomotive.

The old underground flues leading to stoves and boilers were partly rebuilt and partly abandoned. A new overhead gas main for the boiler gas was erected, making use of the sections of the old tubular boilers. A considerable part of the stove and furnace fittings, such as hot-blast valves, gas burners, hopper extension, mud gun, etc., were supplied. A reinforced concrete cinder pit with derrick, hoist and bucket were installed for granulating the cinder.

A new 50-ft. Fairbanks-Morse type F railroad track scale is now being installed. The steam piping of the plant was redesigned and renewed, the sub-contract for both steam and water piping being held by the Pittsburgh Piping & Equipment Co., Pittsburgh. The blowing engines were overhauled and fitted with new valves, and the capacity of the pumping equipment was increased by the installation of two new high-speed engine-driven centrifugal pumps of 3000 gal. per min. capacity each, thus providing for the additional water requirements of the plant. In addition to the turbo-generator for supplying light and power, air compressors were added to the equipment, and a locomotive crane, steam shovel, steam hammer and forge-shop and machine-shop tools were purchased. Two old locomotives were repaired and partly rebuilt.

Rebuilt Trestles and Bins

New facilities for loading and shipping were provided. Perhaps the most difficult portion of the work consisted in practically relaying all the tracks on the property, and in completely rebuilding the ore and coke trestles, as well as the pockets for raw materials. The latter began to arrive about the middle of July. The stock house was remodeled to facilitate handling and charging operations.

The majority of the men used in the construction force were natives, both whites and negroes being employed, but it was necessary to obtain workmen in the North to expedite the work. The construction organization increased from a few men early in June until the maximum of 330 men was reached in the latter part of September. Freyn & Co., the general contractors, had expected to have the furnace ready for blast by Oct. 15, but they succeeded in completing their task ten days earlier, despite labor conditions and the difficulty experienced in obtaining materials. They attribute not a little of their success to the co-operation which came from the Chesapeake & Ohio Railroad, as well as from the various sub-contractors and suppliers of material.

Buffalo Selected as Site for Steam Turbine Plant for Government

The United States Government has purchased a site of 20 acres at Buffalo upon which will be built an extensive plant for the manufacture of steam turbines for the fleet of destroyers to be constructed for the Navy Department. The plant will be operated by the officers of the Fore River Shipbuilding Corporation of Quincy, Mass., now a part of the Bethlehem Shipbuilding Corporation. Ground has already been broken for the initial main building, which is to be 700 ft. in length by 300 ft. in width, of concrete, steel and glass construction. The Aberthaw Construction Co. of Boston has contract for erection of the building; Monk & Johnson, Boston, being the construction engineers. The plant is to be ready for installing machinery Jan. 15. The cost of the equipment, it is stated, will be about $1,000,000. At the outset, 2000 skilled machinists will be employed, and the plant will be operated day and night to meet the demands that will be made upon it. Niagara Falls electric power will be used. The location is at Vulcan Street and the Niagara Falls Division of the New York Central Railroad, adjoining the large plant of J. H. Williams & Co., makers of drop forgings.

Takes Over Projectile Plant

The Liberty Ordnance Co., New York, a newly organized corporation, capitalized at $4,500,000, of which Kenneth W. McNeil of A. McNeil & Sons Co., coal merchant, 1 Broadway, New York, is president, has purchased the plant of the Bridgeport Projectile Co., Bridgeport, Conn. The company has received a Government contract for 12,000,000 shells and 300 naval guns. The plant of the Bridgeport Projectile Co. is one of the finest of the newly built munition factories in this country. It was erected at the beginning of the war by German capitalists to provide war supplies for Germany. Upon its completion in April, 1915, it began work on a $5,000,000 contract received from the German Government for shrapnel cases. Through Carl Heynan, the Kaiser's representative, $2,000,000 was advanced to the company. Heynan severed his connection with the company when Count von Bernstorff was sent back to Germany. Present offices of the Bridgeport Projectile Co. are at 52 Vanderbilt Avenue, New York.

Milwaukee manufacturers who have had under consideration for some time past the specifications for gun carriages for the 3-in. field pieces to be produced by the Wisconsin Gun Co., Milwaukee, have been obliged to abandon the attempt to undertake the carriage production because of the crowded condition of all metal-working shops and the heavy demands entailed by the ordnance project.

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Definitions for Materials

Price fixing is going to improve the terminology of the iron and steel trade. There has always been room for criticism that the industry did not define its materials closely, but no one except the lexicographers seemed to care. It did not matter a great deal whether a given piece of steel be called a bloom, a billet or a slab, and, indeed, the question what is steel has been the cause of unending discussion. The market has settled these questions by attaching specifications or size limits to the material, whereupon the generic term to be applied became of minor consequence. The market would develop a price for the specification that would be mutually satisfactory to buyer and seller.

Now the price fixing reverses the order. In an open market the size or specification determined the price. First came the specification, then the price. Now the price is fixed first and the specifications that are to be included under that price must be drawn up. Prices have been fixed, for instance, at $47.50 for billets 4 x 4 in. and larger, $51 for smaller billets, $50 for slabs and $51 for sheet bars. This settles the matter for billets, provided they are square, but when the billet is not square when is it larger than 4 in. square and when is it smaller? When is a bloom a billet and when is it a slab? The process of manufacture does not define, for, even if it be admitted that all slabbing mills produce slabs, all slabs are not produced in slabbing mills. All blooms may perhaps be produced in a blooming mill but all blooming-mill product is not blooms. Some slabs are produced in a blooming mill.

The railroads have done something to improve the terminology of the steel industry. They have made the definitions of some of the materials more exact, but they have produced some confusion as well, and in some cases there has been one terminology for buying and selling material and another terminology for shipping it.

The gathering of production statistics has not helped to define the intermediate rolled materials, because the statistics of such materials are not gathered. In the gathering of statistics there has been no occasion to define a billet or a slab, for example, because the production statistics do not take cognizance of such materials. If the billet is to be subjected to further rolling it is left alone and the material is caught in the final hot rolled form. Statistics of the production of forging billets are gathered, but the distinction is commercial only, not physical. If the billet is to be forged it is a forging billet, no matter how soft, and if it is to be rolled it is not considered, no matter how hard.

Even in the finished rolled products the nomenclature employed in production statistics is necessarily more referable to origin than to either characteristics or use. The plate mills produce material thinner than quarter-inch, and that is called plates, while the jobbing mills produce material that is thicker than 13 gage, which is called sheets. Consumers require certain descriptions of this material which is sometimes bought from a plate mill and sometimes from a jobbing mill, depending upon market conditions. The market makes the price and the price determines where the order will go. Now the price is to be set first and for a given specification the price should be the same, no matter what the name of the mill may be that rolls it.

With fixed prices for pig iron the analysis must likewise be fixed. There is to be a price for No. 2 foundry iron. It is fortunate that grading by fracture has largely disappeared, for no set of definitions for fractures could possibly escape producing friction. When grading foundry iron by analysis the trade has had little controversy, for if a question arises it is merely necessary to prescribe the analysis in the sales contract. In a period of years the silicon conforming to No. 2 foundry iron in the Central West has varied upon occasion according to market conditions. In a strong market the silicon has more commonly been 1.75 to 2.25 per cent, but in a weak market it has often been defined at 2 to 2.50 per cent. Even at that, silicon has not always been the sole determining element, for low sulphur has sometimes been used to excuse a low silicon content in support of a claim that the iron is No. 2, anyhow.

All that is clear is that now that prices are to be fixed a great many definitions will have to be written. There will be many controversies, no doubt, but the opportunity is a magnificent one for the trade to improve its terminology. The spirit should not be that of merely "getting over" this

trying period but should be that of writing definitions that will remain for the future and be recognized indefinitely as standard. There is a chance to establish a nomenclature for the trade that will make the transaction of business easier after the war.

Allocation and Dilution of Labor

With the problem of the control of prices of raw materials and of the distribution of supplies and machinery now virtually solved by the Government, one of the disturbing factors in industry is fast being removed. Most manufacturers believe that they will soon know definitely just how the distribution of raw materials is to affect them.

But the greater problem—labor—is unsolved. This is the chief source of anxiety to-day. With the ever-increasing demand for workers in munitions plants, shipyards, and airplane and motor truck factories, a serious dislocation of labor is certain unless the Government finds a way to control this vital element in industry. Equally serious will be the further dislocation of wage rates and the continuance and perhaps expansion of this era of extravagant pay.

There is no war cloud of blacker portent than the persistent demand of labor for more pay. Strikes and threats of strikes prevail over the land. City bids against city and factory against factory for workmen, and not alone are those industries remote from the war program the sufferers—the manufacturer who is engaged in Government work finds himself with a shifting and unstable crew. In some cities there is a distressing shortage of labor; in others it is no uncommon sight to see files of men lined up before an employment office. A surplus of skilled labor is nowhere discovered, but unskilled labor is still fairly abundant in some cities. And most large cities have all too big a quota of men idle from choice.

It is hard to see how this difficulty is to be adjusted without legislation authorizing the organization of a body similar to the British Ministry of Munitions with its labor supply department. This means conscription of workers, a thing abhorrent to the American mind, but there is a growing belief that only through direct Government control of labor can the exigencies of the industrial portion of our war program be met. If Sir Stephenson Kent and his fellow delegates from the Ministry of Munitions of Great Britain can convince our manufacturers and the leaders of our workmen that in this direction lies the path that American industry must travel to most efficiently support our troops in the field and to shorten the duration of the war, then will the action of the Council of National Defense in bringing them to this country to address our citizens be more than justified. There are many difficulties and prejudices to be overcome, but it is unthinkable that the patriotism of employer and employee will fail to respond to any plan that gives reasonable assurance of larger production with equitable wages for workers, no unendurable hardships and no exploitation of labor.

New plants starting on Government work must secure the necessary complement of skilled employees, either by bidding for them with higher wages or by Government dilution of labor. The process of overbidding other employers promises to entail an aftermath of wage adjustment on the coming of peace that will create such labor unrest and industrial strife as America never has seen. Labor dilution—the transfer of skilled workers from the factory with a high percentage to the factory with a low percentage—appears the most logical solution of this problem. The allocation of skilled workmen to the plants whose products are most promptly needed on the fighting line needs little defense. It may be a matter of regret to break into a well-organized working force engaged in making the products of peace, but our real task now is to win the war. To this purpose every energy is being bent, and there must be sacrifices of individual profit and comfort in order that the future security and peace of the nation be assured —and that at the earliest possible moment.

Priority in Machine Tools

From the standpoint of efficiency in manufacturing guns, ammunition, airplane engines, turbines, ships and many other much-needed equipment for the war, nothing is of more importance than the tardy but none the less welcome effort of the Government authorities to straighten out the tangle in deliveries of machine-tools and kindred machinery which the priority orders of various departments at Washington have brought about.

Manufacturers of machine-tools have become almost exhausted by the effort of keeping their delivery records in proper order. One schedule of deliveries has been made up only to be torn asunder a few days later by another priority order. Even the recent decision of the Government to divide the priority orders into different classes, according to their relative importance in carrying on the war, was of little effect. Picture a manufacturer of machine tools whose plant is already filled up for many months ahead with nothing but Government work, all on priority orders, and then imagine his dismay when told that he must make certain deliveries within three or four weeks. His answer obviously must be that to shove in the new work ahead of the machines already on order simply means postponing deliveries on some of these latter machines, but this the various Government departments concerned will not listen to, and it ends up with the machine-tool builder being asked to do the impossible. To the credit of many of them it may be said that in the matter of deliveries they have achieved the near-impossible, and it is not going too far to say that no doubt many of them, spurred on by the urgent necessities of the Government, have excelled their own expectations. And this, too, despite the withdrawal of labor by the draft and the attractions of higher wages paid in munitions shops.

The Government has realized that something must be done to assist the machine-tool builders out of their dilemma. Hence a new department has been created by the War Industries Board, with G. E. Merryweather, a Cleveland machine-tool man-

ufacturer, who has been called into Government service, its head. Mr. Merryweather has already begun a movement to place all priority orders on a basis that will enable machinery builders to know where they stand. About fifteen of the foremost machine-tool engineers of the country have been summoned to Washington to assist in unraveling the tangle which priority orders have created, and it is confidently predicted that before their labors are ended the situation will have been so greatly improved that deliveries of machinery may proceed with few further hitches. The Government will map out its own needs as far ahead as possible and assist the machine-tool builders in arranging their delivery schedules in a way that will contribute most effectively to the war program.

Needs of the Ordnance Department

The Ordnance Department at Washington has called the attention of THE IRON AGE to the urgent necessity of co-operation on the part of metal-working trades in the work of bringing to full strength the necessary quota of men for the enlisted ordnance corps of the National Army. Skilled men in a great many different lines of trade are urgently needed at this time. In order to carry on effective fighting, men in the front line must have the skillful co-operation of specialists behind, and it is important that each man does the work for which he is best fitted, thus saving the Government a long period of instruction and also clearly increasing his own chances for advancement in rank. The ordnance corps has well been called "The Army Behind the Army."

We take pleasure in calling attention to the present condition of affairs. While, of course, there is a decided shortage of labor in iron-working trades, it is possible to spare a man here and there, and a considerable number should be available. Many are not absolutely indispensable and would be willing to sacrifice a part of their salaries to serve their country. The full details as to methods of enlisting can be obtained from the Chief of Ordnance, Enlisted Personnel Division, Washington, D. C.

CORRESPONDENCE

British Exports of Commercial Steel

To the Editor: Referring to your issue of Aug. 30, 1917, page 502, you state that "Great Britain is making highly profitable export shipments of commercial steel." You made a similar remark in a previous issue and I beg to inform you that this statement is incorrect.

Under the Defense of the Realm Act not a single ounce of steel may be used for commercial purposes in Great Britain. Steel is only allowed to be manufactured, rolled or drawn, for orders which bear a ministry of munitions, admiralty, war office or other government order number, or for the preservation of food crops. In addition to this the export of commercial steel is *entirely* prohibited, but we are, of course, exporting a very small quantity of war steel to our allies.

You are doing us an injustice in making the above statement, and I think it would only be fair that you give publicity to this communication.

W. STUART MILLER.

Manchester, England, Sept. 20.

WILL TRADE VESSELS

America Will Help France and Obtain Boats to Haul Manganese Ore

WASHINGTON, Oct. 23.—Steps have been taken by the United States Shipping Board to supply the French Government immediately with steam tonnage sufficient to take care of its emergency needs. The board will turn over 20 new ships built in American yards to the French, one of which of 6000 tons deadweight was completed and delivered this week. In addition, the Shipping Board will charter to the French 200,000 tons of American steamships in exchange for 400,000 tons of French sailing vessels. This latter trade will supply ships to engage in commerce with Latin America.

Now that the urgent needs of the French Government have been partially met by the United States, the Shipping Board intends next to take up the petitions of the Italian Government for cargo ships. France's needs were far more urgent than the needs of any of the other nations allied with us. The French have been urging thir claims upon us through various channels and it was with considerable relief that they received the promises of the Shipping Board last week.

The 20 new ships, which will be turned over to France, represent from 70,000 to 80,000 tons deadweight. They were built on the Great Lakes in American yards; some at Toledo, others at Detroit, and others at Chicago. Five of these vessels were built under original contracts for France, and a number of them were built under contract for the Cunard Line.

One ship has been delivered from the Lakes. Ten more will come through within the next week, and the whole 20 will be delivered, according to information in possession of the Shipping Board, within the next 30 days. In view of the closing of the Lakes by the winter season it is necessary that all new tonnage built in lake yards shall be delivered in the Fall.

The trade of American steamers for French sailing vessels resulted from entirely separate negotiations. Sailing vessels have proved useless in the submarine zone. The British lost most of theirs. The French had a similar experience but were successful in dispatching about 400,000 tons of her steel sailing vessels to this side of the Atlantic. These vessels are now in South American waters. Aside from the profit of operation they are of no use to the French Government now because it would be a certain loss to send them back through the submarine zone. For this reason the French have agreed to charter these vessels to the Shipping Board, and in return the Shipping Board will charter to the French 200,000 tons of American steam shipping. This tonnage will undoubtedly be withdrawn from the Latin-American trade and turned over to the French for the Atlantic service. We will take the French sailing vessels under charter with their French crews and operate them in this same trade.

According to the plans of the Shipping Board, the French sailing vessels will be used to bring manganese ore from Brazil and nitrate from Chile. They will also be used to bring chrome ore from the French colony of New Caledonia.

Brazil's First Steel Output

RIO DE JANEIRO, BRAZIL, Oct. 22.—(*By Cable.*)

The first commercial steel ever produced in Brazil was made on Oct. 19 in a plant using a Whiting converter. More complete details will be furnished later.

William H. Wilkoff, president of the Youngstown Car Co., Youngstown, Ohio, announced last Saturday that his corporation has just secured an order from the Government for the construction of 500 dumping cars to be used in army engineering work both in this country and abroad. The order is to be completed within 60 days. The Youngstown Car Co. makes a specialty of turning out dinkey cars for construction companies.

RAILROADS GET NEW HEARING

Eastern Lines Will Be Heard Nov. 5 on Claims for Higher Rates

The Eastern railroad companies have been accorded more favorable treatment by the Interstate Commerce Commission than they expected. Having petitioned for the opportunity to present anew their claims for higher rates, the railroad companies were advised Oct. 22 that the commission will go even further and will reopen the entire 15 per cent rate case. In addition, the commission shows its appreciation of the conditions under which the railroads are struggling by saying that if further financial relief is needed by the carriers such relief should be applied promptly. The commission instead of agreeing to the suggestion of the railroads that 60 days should be allowed them to prepare a new case has ordered the old case reopened and hearings begun on Nov. 5.

In their application, made Oct. 17, representatives of the Eastern roads suggested at an informal conference that they should have permission to present evidence as to why the increases denied them last June should now be granted. They had intended merely to ask for increases on commodity rates, particularly grain and live stock. It would not surprise many if by Jan. 1, should the carriers make good their claims, the whole matter may be settled, whereas it was not expected that hearings would be begun much before then. The response of the commission is quite generally accepted as foreshadowing a recognition of their advancing costs and the difficulties they are meeting. It is regarded as well within the realm of possibility that the commission may now give the railroads the full 15 per cent asked for. It is also regarded as probable that the Southern and Western carriers, particularly the latter, already showing reductions in net earnings, will join in the request for an adv..nce.

An advance in freight rates is of course not likely to be warmly welcomed by shippers. The cost of doing business will thus be further enhanced and they cannot unload every item of this kind on the ultimate consumer. But the serious plight of the railroads is so well established and their necessities are so urgent that the shippers would show a proper spirit if they were to refrain from bitterly attacking the application for higher rates.

Needed for the Army

The Quartermaster Enlisted Reserve Corps, with recruiting headquarters at 357 Broadway, New York, has received a new authorization to enlist men to follow their civilian trades in the Army, for duty in this country and abroad.

The men particularly needed at this time include Electricians, Tinsmiths, Iron Workers, Mechanics and Blacksmiths. Enlistment is open to citizens of the United States, or to those men who have declared their intentions of becoming citizens. They must be between the ages of 18 and 45 years and have no one depending on them for support.

Added to Conservation List

WASHINGTON, Oct. 23.—A long list has been added to the so-called "conservation list" by the War Trade Board. This is a list of articles which will not be allowed to be exported except for war purposes inasmuch as the United States is in need of the materials or articles and must conserve its own supply. The list includes chrome steel and a number of similar materials.

The Norton Co., Worcester, Mass., abrasive and grinding wheel manufacturer, which has made large extensions to its plant during the past three years and has built a notable industrial village, has bought 205 acres adjoining its present tract to provide for future plant expansion and more workmen's homes. The company has no plans for immediate new construction.

CONTENTS

To Prepare Soldier Cripples for Industry 981
Will Build Wooden Ships 982
A Seventy-fifth Anniversary 983
Competitive Education Between Nations 984
Will Need Machinery After the War 985
Steady Load with Waste Gas 985
New Four-Spindle Automatic 986
Central Steel Co. Additions 987
Pittsburgh Foundrymen's Association 987
Cast-Iron Shells in Permanent Molds 988
Floor Type Tapping and Drilling Machine 990
Nitre Cake for Pickling Brass 991
Swedish Iron-Ore and Steel Output in 1916 991
New Electric Steel Foundry in Ohio 991
A 14-Inch Lathe with Special Feed 991
Steel Plant Electrical Safety Provisions 992
Improving Correspondence Discussed 992
The First Heine Boiler Still Fit for Service 992
Purchasing Agents Close Meeting 992
New Military Truck Tested 993
An Example of Three-in-One Piping 993
Failure of Boiler Plates in Service 994
War Problems Discussed 996
Japanese Will Aid Chinese Enterprise 997
Discussion of Papers at Institute Meeting in Cincinnati 997
A New 13-Inch Geared Lathe for Toolrooms 997
A Rising Alabama City 998
Steel Plant Safety 998
Quenching and Lubricating Oil Cooler 999
How Goshen Furnace Was Remodeled 1000
Buffalo Selected as Site for Steam Turbine Plant for Government 1001
Takes Over Projectile Plant 1001
Editorials:
Definitions for Materials 1002
Allocation and Dilution of Labor 1003
Priority in Machine Tools 1003
Needs of the Ordnance Department 1004
Correspondence 1004
Will Trade Vessels 1004
Brazil's First Steel Output 1004
Railroads Get New Hearing 1005
Needed for the Army 1005
Added to Conservation List 1005
Standardized Ship Steel 1006
McDonald Mill Started 1006
Takes Over Wisconsin Mine 1006
Railroad Ownership 1007
Conserving British Blast-Furnace Dust 1007
Spain's Iron and Manganese Ore Exports in 1917 1007
Iron and Steel Markets 1008
Plates and Shapes for New Destroyers 1018
Absorbs Canton Sheet Steel Co. 1018
British Production of Stainless Steel Prohibited 1018
Iron and Industrial Stocks 1019
Nova Scotia Steel & Coal Co. Production 1019
Metal Markets 1020
Prices Finished Iron and Steel, f.o.b. Pittsburgh 1021
Pittsburgh and Nearby Districts 1022
Liberty Mill Started 1022
Lake Ore to St. Louis by Water 1022
Buying Liberty Bonds 1023
Strike of Building Trades at Arsenal 1023
$100,000,000 for Ordnance Depot in France 1023
Personal 1024
Obituary 1025
Solving Fuel Problems 1025
Table of Fixed Prices 1026
Increased Efficiency 1026
Merryweather in Charge of Machine Tool Matters 1026
Machinery Markets and News of the Works 1027

STANDARDIZED SHIP STEEL

Practice Recommended by Steel Makers to Secure Maximum Output

To secure maximum output of structural steel for cargo ships, American steel makers, after some months of investigation and collaboration with others concerned, have drawn up a statement of standard practice recommended by them for use in designing. It has been adopted by the Emergency Fleet Corporation. It aims at a use of standard structural sections rather than so-called ship shapes; it reduces the number of sizes of sections and the number of different thicknesses of plates; it is calculated to eliminate special features of ship structural design which are regarded as of doubtful value measured in terms of the demand for utmost rapidity of construction. It has, in short, for a primary object the establishment of standardized design so that mill facilities for one ship will suffice for another with the closest possible approach to the intensified duplication system of manufacturing peculiar to industrial practices generally in this country. The standard practice is of course apart from the talked-of plan of making standard ships, a matter which rests with the shipbuilders themselves and in fact already put into practice by some of them. In the light that the standard practice mentioned recognizes the quality requirements of the British, French and American Governments, it marks a big step forward in the making of an international ship steel specification. Further it may be remarked that even standard order forms, all of one style of arrangement and size, are provided for, to insure proper routine in mill operations, thus to supply material to shipyards in proper rotation, and to minimize the overlooking from time to time of single items, as is occasionally done when all sorts and conditions of purchasing order blanks are allowed.

A small pamphlet printing of the standard practice has been issued by the Carnegie Steel Co. The recommendations, as there explained, include the following:

That shipbuilding practice conform to uses established as standard in the fabrication of shapes and plates for bridges, buildings and cars, and that useless and minute variations be absolutely eliminated.

That to relieve the present mill congestion the use of tees and deck beams be eliminated to the greatest extent possible.

That structural channels or angles be used for ship channels or bulb angles; provided, however, that ship channels and bulb angles may be rolled if required by shipbuilders' schedules.

That thicknesses of plates be specified in multiples of 1/16 in. (1/32 in. where necessary).

That sketch plates be ordered in multiple and cut to size at the shipyard, rolling mills to furnish to sketch only straight double or single taper plates.

That within universal plate mill limits, plates be furnished sheared or universal at mills' option. Where sheared plates are absolutely necessary, orders should be marked "sheared only."

Plates, shapes and bars 3 ft. long and shorter should be ordered in multiple lengths. To assist mills, orders should specify lengths into which multiples are to be cut so as to permit, at mills' option, application of short length pieces.

Plates narrower than 18 in. (preferably 24 in.) and lighter than ¼ in. should be ordered in multiple widths, to be recut to widths at the shipyards, and to assist mills orders should specify widths into which multiples are to be cut so as to permit, at mills' option, application of narrow width plates.

That extreme sizes of plates, as shown in makers' published lists, both as to widths and lengths, should be avoided, as the rolling of such extreme sizes reduces the output of the mills.

That the steel be manufactured in accordance with American Bureau of Shipping requirements, Lloyd's Register of Shipping or Bureau Veritas as may be called for by shipbuilders' schedules, these classification societies accepting standard specifications for structural steel for ships of the American Society for Testing Materials.

The recommendations list the standard size of angles and thicknesses of plates.

McDonald Mill Started

YOUNGSTOWN, Oct. 23.—Pressing an electric button, Thomas McDonald, consulting manager of the Carnegie Steel Co. in the Youngstown district, last Friday afternoon started in motion the machinery of a bar mill at the new McDonald plant, located just west of this city. A group of United States Steel Corporation officials from Pittsburgh, headed by Homer G. Williams, president of the Carnegie Steel Co., witnessed the operation. W. J. Wigham, assistant to the president, and a dozen other officials came from Pittsburgh in a special car. Others present included James H. Grose, district superintendent, who will be in general charge of the new plant; W. U. Dennison, superintendent of the McDonald mills; A. W. Griffith, superintendent of bar mills in the district, and members of their staffs.

On the initial run a small heat was rolled, the machinery performing without a hitch. Only the cooling bed is uncompleted. Nine mills are now being constructed, three bar and six hoop mills, and they will have an annual capacity of 500,000 tons. The machine shop, a brick building, was the first to be completed. The furnace building, where the steel will be heated that is brought from the Ohio Works for rolling, is also virtually finished. The new plant will be operated entirely by electricity. Current will be transmitted from the Ohio Works by means of high tension wires strung on large columns, resting on concrete bases. All the latest electrical devices are being installed, much of the material being furnished by the Westinghouse Electric & Mfg. Co.

There has been much activity for more than a year at McDonald, the work of building the new plant that will eventually represent approximately $12,000,000 being pushed along rapidly. In connecton with the mill the Carnegie Steel Co. has appropriated $2,000,000 for the construction of dwellings in the new steel town of McDonald, close by the plant.

It is the plan of the management to get two bar mills in operation by Nov. 15. Before leaving McDonald Friday, Homer G. Williams, president of the Carnegie Steel Co., expressed himself as entirely satisfied and pleased with the showing made at McDonald since the construction work commenced.

Takes Over Wisconsin Mine

MILWAUKEE, WIS., Oct. 22.—The Republic Iron & Steel Co., Youngstown, O., has taken over the Northern Chief iron mine at Plummer Mine, a few miles southwest of Hurley, Wis., and leased acreage within a radius of two miles of the property, and will re-open the mine at once. The Plummer mine has been idle for several years, having been abandoned by its former owners, as being unprofitable. The shaft now is down 1300 ft., but will be deepened much further because of the presence of a high quality of ore. It is stated that present conditions make it advisable to go to considerable expense in developing the Northern Chief property, which formerly was one of the best producers on the Gogebic range. Francis J. Webb, Duluth, Minn., general manager of the Republic properties on the Mesaba range, will have charge also of the new property.

Corrigan, McKinney & Co., Cleveland, Oct. 22, blew in their No. 2 River furnace which has been out of blast for relining. The four stacks are now running, one that had been banked for some time because of the coal shortage having been started up again last week.

A. H. Cox & Co., dealers in machinery and electrical equipment and engineers and contractors for electrical and mechanical power plants, Seattle, Wash., have moved into the building adjoining their present quarters at 309 First Avenue South.

RAILROAD OWNERSHIP

Public Railroad Regulators Discuss Government Ownership of Lines

WASHINGTON, Oct. 23.—The National Association of Railway Commissioners, in its annual session here last week, took steps to create a special committee to give exclusive study to Government ownership of railroads. The association is composed of all the Federal and State officials who have been delegated authority to regulate railroads and public utilities. A report on public ownership of American railroads was read to the association by Edwin O. Edgerton of California, which was also signed by John Guiher of Iowa, and Shelby Taylor of Louisiana.

"Irrespective of whether he is an advocate or an opponent of the theory that the interests of the people are best served by public ownership of utilities," said Mr. Edgerton, "the student must recognize the fact that public ownership, whether national, state, district, or municipal, is gradually replacing both regulated and unregulated private ownership. In countries at war, that is, in countries where the state insists on a maximum of effort, the march in the direction of complete public control appears to be more rapid than in countries leading a normal existence. But the direction is clear in both cases." He gave a resume of railroad control throughout the world from which the following extracts are taken:

Of the total mileage of the world for 1913 (690,165 miles), private companies owned 464,421 miles, or 67 per cent, and governments owned 225,744 miles, or 33 per cent. In 1912 the private companies owned 68 per cent. The government railways gained one per cent by increasing their mileage by 9644 miles, while the mileage of private companies increased only 5487 miles.

It will be noted that, in respect of length of lines, outside of North and South America, government ownership greatly predominates, but that the privately-owned mileage in the United States, 256,823, greatly exceeds the mileage of all the government-owned roads in the world. It is somewhat surprising, however, to find that the greatest increase in government mileage is in North and South America, due to the absorption of private lines in Mexico and Argentina. Even outside of the United States, however, private ownership is greatly predominant in America.

In the majority of the countries of the world, also, prior to the war, private ownership of railroads continued to prevail. Of 75 nations and colonies for which statistics are given, 42 had more private than government mileage, while 33 have more government mileage. While in 26 countries the entire mileage was privately owned, in only 7 are all the railroads owned by the state. These were Serbia, Bulgaria, Natal and four German colonies in Africa. In Europe state ownership predominates in only 10 out of 21 countries.

Mr. Edgerton cited the fact that the recommendation has been made in Canada to combine all the Canadian roads in one government corporation and continued:

There are very few thinking men left in the country who will insist that regulation in its present form can adequately deal with our railroad problem. The inadequacy of Federal regulation in the matter of securities control is a yearly recurring topic in the reports of the Interstate Commerce Commission, as in the reports of this association: Federal incorporation for interstate roads is quite uniformly recognized as necessary, and the railroads themselves have come to this conclusion.

That there is conflict and duplication between Federal and State commissions cannot be denied. That regulation is often made ineffective by the conflict and onerous by the duplication is clear. Whether or not the period of railroad regulation is merely a necessary step in the evolution of the public utility from private to public control and ownership, the fact is that our railroads today have gone beyond regulation in some of their very essentials. Here, too, the war has revealed the weak spots and pointed out the remedies that during peace, it would have taken us a long time to find.

After describing the trend of control in the United States since we became a belligerent, citing the work of the Railway War Board which has co-ordinated all the railroad facilities of the United States, he said: "A complete national railroad system means, inevitably, control, pooling and elimination of wasteful and unrealizes more than ever that its railroads are the arteries of its economic life and that their ultimate direction cannot be left in the hands of private owners, however high a caliber these owners may represent as men and citizens." He concluded:

In the United States a national transportation policy embracing an intelligent plan of railroad construction, efficient nation-wide operation, the elements of financing, of rate making, of traffic development, of thoughtful adjustment of water and rail transportation, and of other equally fundamental policies, has heretofore been an impossibility. We have come to uniform accounting, but beyond that it seems we have been unable to go. The times have forced a change and the new national railroad policy is rapidly assuming its first shape without Government direction and with almost no Government co-operation.

The direction of this policy is also quite distinctly defined: It is toward the elimination of what little remaining competition there was between carriers; toward centralization; toward uniform standards of construction and operation; and, most important of all, toward higher rates. In spite of the great savings already effected by the greater efficiency of the new system, and in spite of the much greater savings still possible, higher rates appear inevitable unless the Government becomes the directing force and, from national considerations, takes its controlling part in the shaping of this new national railroad policy.

The National Association of Railway Commissioners, in our opinion, has no more important duty to perform at this time than to give its best thoughts to these new developments. We have, therefore, concluded that it should continue the study of these questions through the instrumentality of a permanent committee, and it has seemed to us that at this time our committee can render a service to the association by an attempt to give an outline of the scope of the permanent committee's duties and by a recommendation indicating along what lines further investigation should be made.

This report, however, was not made unanimous to the National Association. Carl D. Jackson of Wisconsin insisted that it was too early to come to any conclusion regarding the advisability of public ownership. He said: "It may be questioned as to whether the experience of foreign countries operating utilities for war purposes and under forced conditions will develop the test or standard for operating under normal and peaceful conditions. Unquestionably many of the lessons as to economic and efficient operation through broader control, pooling and elimination of wasteful and unnecessary competition, will not be lost upon a return of peace, and I believe that the country and Congress will see the advisability of framing laws calculated to bring about economical and efficient co-operation in place of laws aimed at developing wasteful competition."

Conserving British Blast-Furnace Dust

Conservation of blast-furnace dust has been introduced in England, evidently with a view to recovering its potash content. The Minister of Munitions has issued an order providing that no person shall buy, sell, deal in or dispose of any blast-furnace dust, except under, and in accordance with the terms of a license issued on behalf of the Minister of Munitions by the Controller of Potash Production, and that no person shall treat any such dust so as to extract any component part thereof, except in accordance with the terms of the license.

For the purpose of this order, blast-furnace dust shall mean dust deposited or otherwise derived from the gases of any furnace used for treating ores for the production of iron or any of its alloys.

Spain's Iron and Manganese Ore Exports in 1917

Spain's exports of iron ore and manganese ore have shown considerable increase in the first half of 1917 as compared with the same period in 1916. To July 1, 1917, the exports of iron ore were 2,588,710 metric tons as compared with 2,386,439 tons to July 1, 1916. The manganese ore exports to July 1, this year, have been 8527 tons against 2310 tons to July 1, 1916. There has been a falling off in exports of iron pyrites of over 500,000 tons, the total to July 1, 1917, having been 1,014,636 tons.

Iron and Steel Markets

PRICE FIXING IN DOUBT

Delays Point to Leaving Details to Trade

Some of the New Prices Established—Sentiment Sought on Abrogating Contracts

Further price-fixing announcements from Washington seem unlikely. Though an agreement was reached between the War Industries Board and the producers, in New York, on Oct. 16, no new prices have been named. Thus it appears that the modification in Government policy noted last week has taken shape, and the industry is expected literally to adjust prices on even major commodities. Already the leading wire maker has approached the mean between the two general wire levels which have long obtained, quoting $3.50 on nails, or 30c. nearer the $4 basis of other mills. It will not be surprising if the presidential address of Judge Gary before the American Iron and Steel Institute, in Cincinnati, on Friday, sheds some light.

The War Industries Board has had as a primary object the securing of maximum production of ships and shells, and the magnitude of the task and the size of the organization it is building may well militate against too rapidly instituting sweeping edicts over materials of less importance for the work of the war. How thoroughly it will be possible, without authoritative announcement or the exactions of priority orders, to secure immediately the "one-price-for-all" policy is an unanswered question.

On top of this is the canvassing now going on among consumers by the Federal Trade Commission to ascertain opinions as to abrogation of contracts. Concern is shown among students of trade over the apparent effort to secure a contract nullification or adjustment feature in the proposed Pomerene price-fixing bill, with all that it might mean in unstabilizing business remote from basic material production.

When all is summed up, the general consumer is still in the dark. With the increasing drafts of labor, the minimum immigration, the overloaded transportation and terminal facilities, the fuel scarcity, not to mention the checks likely in winter, production of iron and steel for this year, even considering increased capacity of plants, can hardly exceed that of last year. One authoritative estimate is that next year's total output will not be over 85 per cent of last year's.

If price fixing is regarded as revolving about finished steel, as the immediate need of war, and if the agreed prices represent, as is understood to be the case, substantially the mill billing prices of September, then the higher average billing at the end of the year is a pointing finger. Much that is said of possible price revision on Jan. 1, however, refers to pig iron as the general basing product, and this, it is suggested, should in the opinion of the Government be lowered. What will likely happen to steel prices is thus a matter of conjecture.

Transactions have established wire rods at $57 per ton, furnace coke at $6, and steel bars and shapes at the agreed prices. In bars and structural material, sales have been made for deliveries extending into 1918; a lot of 10,000 tons of bars for the rest of this year and the first quarter of 1918 has been closed at 2.90c. in the Chicago territory, and the Pittsburgh basing is retained.

Buying of pig iron has continued as rapidly as furnaces have been willing to take orders and demand has been far in excess of the tonnage which the makers felt they should book. This is illustrated in the case of charcoal pig iron; a Michigan company sold about 4000 tons on the basis of $35.50 for grades 1 to 4 and $38 for Scotch and low silicon irons and could have disposed of a much larger tonnage. There has been some hesitancy on the part of both buyers and sellers because the Government attitude has not yet been made known on the recommendations relating to differentials, but it is now understood that all minor matters are to be left to the trade to be worked out.

Some coke producers continue to show a disposition to evade selling at the fixed price of $6 for both foundry and furnace coke. Blast furnace operators, unable to obtain coke, are making complaint at Washington. Production is almost up to normal in the Connellsville region and furnace men assert there is ample to meet demands for spot delivery as well as to fill contracts.

As to unannounced prices it may be stated the agreed plan provided that steel scrap, like pig iron, should be set at the one maximum price for all scrap consuming centers. For tubular goods, the level of the May 1 card is taken, and for tin plate prices slightly higher than those in effect in the last half of 1917. The matter of rail prices is left to the railroads and the rail makers.

The navy's distribution of structural material for destroyers covers 65,000 tons of plates and 20,000 tons of shapes and before long about three times this amount of steel will be required for Government shipbuilding. An important development in establishing a standardization of structural steel for ships has been realized. Mills will be able to secure tonnage production and fabricators with little building work will be well engaged in the country's supreme war effort.

Pittsburgh

PITTSBURGH, Oct. 23 (*By Wire*).

Another remarkably quiet week in the steel trade has gone by and the trade is still awaiting further announcement from Washington of Government prices on the other iron and steel articles, which up to this writing have not been given out. It was fully expected that last week the Government would announce prices on such important items as steel sheets, wire products, iron and steel pipe and other lighter forms of finished steel, but the expected announcement has not yet been forthcoming. In the meantime the whole trade is in a waiting attitude and very little new business is being placed by domestic consumers. Most of the new orders being taken by the mills is either direct or indirect Government orders. On these orders for materials on

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 24, 1917.	Oct. 17, 1917.	Sept. 26, 1917.	Oct. 25, 1916.
No. 2 X, Philadelphia	$34.25	$34.25	....	$21.00
No. 2, Valley furnace	33.00	33.00	$33.00	21.00
No. 2 Southern, Cin'ti	35.90	35.90	....	18.90
No. 2, Birmingham, Ala.	33.00	33.00	....	16.00
No. 2, furnace, Chicago**	33.00	33.00	....	22.00
Basic, del'd, eastern Pa.	33.75	33.75	45.00	21.50
Basic, Valley furnace	33.00	33.00	33.00	20.00
Bessemer, Pittsburgh	37.25	37.25	37.25	24.95
Malleable Bess., Ch'go**	33.00	....	....	21.50
Gray forge, Pittsburgh	32.75	32.75	....	20.95
L. S. charcoal, Chicago	35.50	....	....	20.25
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	....	....	$38.00	$33.00
O.-h. rails, heavy, at mill	....	....	40.00	35.00
Bess. billets, Pittsburgh	*$47.50	*$47.50	60.00	50.00
O.-h. billets, Pittsburgh	*47.50	*47.50	60.00	50.00
O-h. sheet bars, P'gh	*51.00	*51.00	70.00	50.00
Forging billets, base, P'gh	....	....	90.00	73.00
O.-h. billets, Phila.	....	....	70.00	50.00
Wire rods, Pittsburgh	57.00	*57.00	85.00	55.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia	4.25	4.25	4.935	2.659
Iron bars, Pittsburgh	...	...	4.75	2.75
Iron bars, Chicago	4.50	4.50	4.50	2.35
Steel bars, Pittsburgh	2.90	†*2.90	4.00	2.75
Steel bars, New York	3.095	...	4.195	2.919
Tank plates, Pittsburgh	†*3.25	†*3.25	8.00	4.00
Tank plates, New York	...	...	8.195	4.169
Beams, etc., Pittsburgh	3.00	†*3.00	4.00	2.75
Beams, etc., New York	3.195	†*3.195	4.445	2.869
Skelp, grooved steel, P'gh	*2.90	*2.90	...	2.50
Skelp, sheared steel, P'gh	*3.25	*3.25	...	2.60
Steel hoops, Pittsburgh	...	...	5.75	3.00

*Agreed prices. †As yet only a few sales made.
**The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Oct. 24, 1917. Cents.	Oct. 17, 1917. Cents.	Sept. 26, 1917. Cents.	Oct. 25, 1916. Cents.
Sheets, black, No. 28, P'gh	...	...	8.50	3.40
Sheets, galv., No. 28, P'gh	...	...	9.50	4.75
Wire nails, Pittsburgh	...	...	4.00	2.70
Cut nails, Pittsburgh	...	...	4.65	2.70
Fence wire, base, P'gh	...	...	3.95	2.65
Barb wire, galv., P'gh	...	...	4.85	3.55
Old Materials, Per Gross Ton:				
Iron rails, Chicago	$36.00	$36.00	$40.00	$22.00
Iron rails, Philadelphia	38.00	38.00	43.00	21.00
Carwheels, Chicago	26.00	26.00	30.00	14.50
Carwheels, Philadelphia	29.00	29.00	32.00	16.00
Heavy steel scrap, P'gh	27.00	27.00	33.00	19.00
Heavy steel scrap, Phila.	25.00	25.00	30.00	16.00
Heavy steel scrap, Ch'go	26.00	25.00	30.00	17.75
No. 1 cast, Pittsburgh	27.00	27.00	30.00	16.00
No. 1 cast, Philadelphia	28.00	28.00	30.00	16.00
No. 1 cast, Ch'go (net ton)	20.00	20.00	18.00	14.75
No. 1 RR. wrot, Phila.	35.00	35.00	43.00	22.50
No. 1 RR. wrot, Ch'go (net)	28.50	29.50	34.00	18.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$6.00	†*$6.00	$6.00	$7.00
Furnace coke, future	6.00	†*6.00	6.00	3.75
Foundry coke, prompt	†*6.00	...	...	5.00
Foundry coke, future	†*6.00	...	...	4.50
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	23.50	23.50	23.50	28.50
Electrolytic copper, N. Y.	23.50	23.50	23.50	28.50
Spelter, St Louis	8.00	8.00	8.25	10.00
Spelter, New York	8.25	8.25	8.50	10.25
Lead, St. Louis	6.12½	6.87½	7.82½	6.92½
Lead, New York	6.25	7.00	7.95	7.00
Tin, New York	61.62½	61.00	62.00	41.25
Antimony (Asiatic), N. Y.	14.75	15.00	15.00	13.00
Tin plate, 100-lb. box, P'gh.	....	....	$12.00	$5.75

which the Government has announced prices, these prices apply, but so far there have been very few sales by the mills of plates, shapes and bars, also of steel billets and sheet bars at the Government prices. There have been fairly heavy sales of pig iron at the Government prices of $33 at Valley furnace for basic and No. 2 foundry and $36.30 for Bessemer. The steel mills, when offered orders at Government prices for delivery in this quarter, simply say that they are filled up into next year and have no material to offer on new business. In a few cases there have been sales of plates, steel bars and possibly shapes at Government prices, but these were made only to regular customers and to help out on contracts taken some time ago, and for which they did not have enough material to complete the contracts. It should be borne in mind that all Government prices fixed thus far apply only for the present quarter ending Dec. 31 and are subject to revision on Jan. 1 or after. With the mills loaded up with business for some months, it is going to be very hard for consumers to find any mills that have any material to spare for the present quarter, and new business up to the end of this year is certain to be very light. The coal situation is still bad, particularly in the Youngstown, Ohio, district, and is interfering with the output to some extent. The supply of cars in the past week has been bad, getting as low in the Connellsville coke regions as 30 per cent. The scarcity of labor is being more keenly felt right along, but as soon as cold weather comes will likely improve. There are thousands of men who do not want to work outdoors in cold weather, and as soon as it comes they hunt inside jobs where they can keep warm. Several of the tin plate mills report the supply of labor better in the past week or two than for some time.

Pig Iron.—The local market is quiet, and there is very little new inquiry. Most of the buying of Bessemer and basic iron in this district, since the Government announced prices on pig iron on Sept. 24, has been done by a local steel company, whose blast furnaces were banked recently for a short time, requiring that this concern take in a good deal of outside iron. It is estimated that this interest has bought close to 60,000 tons of Bessemer and basic iron at the full official prices of $33 for basic and $36.30 for Bessemer at Valley furnace. The Westinghouse Air Brake Co. recently sent out an inquiry for about 7000 tons of iron and has closed for about 3000 tons of No. 2 foundry and 1000 tons of malleable Bessemer on the basis of $33 for the foundry iron and $33.50 for the malleable Bessemer at Valley furnace. The Westinghouse Electric & Mfg. Co. has also closed for about 2500 tons of malleable Bessemer iron for delivery to its Cleveland foundries to be used in making castings for the Government. A Southern Ohio open hearth steel plant has an inquiry out for 5000 to 10,000 tons of basic iron which has not yet been closed. There has been moderate buying of No. 2 foundry iron at the official price of $33 Valley furnace. Bessemer and basic pig iron are reported scarce, and there is ready sale for all that can be picked up for prompt shipment.

We quote as follows: Basic pig iron, $33; Bessemer, $36.30; gray forge, $32; No. 2 foundry, $33; No. 3 foundry, $32.50, and malleable Bessemer, $33.50, all per gross ton at Valley furnace, the freight rate for delivery in the Cleveland and Pittsburgh districts being 95c. per ton.

Billets and Sheet Bars.—So far as we can learn, there have been no sales of soft open hearth or Bessemer billets at $47.50 or of sheet bars at $51, Pittsburgh, these being the prices announced by the Government on Oct. 11. The steel mills have regular customers for billets and sheet bars at much higher prices who take their regular output, and as the Government prices on billets and sheet bars apply only for the present quarter, being subject to revision on Jan. 1 or after, there is not much probability of any heavy sales of billets or sheet bars at these prices. The differential of $3.50 per ton in prices between billets and sheet bars has not yet been satisfactorily explained, but probably was made so large for the reason that a few months ago there was a spread of $10 or more in favor of sheet

bars over billets, but this was an unnatural spread and was brought about by unusual conditions existing at the time. No price has yet been named on forging billets, and the only thing to do is to omit quotations.

Ferroalloys.—Announcement is looked for at any time of Government prices on ferroalloys, and in the meantime there is practically no new buying, consumers holding off, waiting until the official prices are given out. We quote 80 per cent domestic ferromanganese for any delivery at $300 per gross ton, delivered to buyer's mill, and on a firm offer, this might be shaded. We quote 18 to 22 per cent spiegeleisen or about $70 and 50 per cent ferrosilicon in carload lots at $140 to $150, delivered, lower prices being made on 100 ton lots and over.

We quote 9 per cent Bessemer ferrosilicon at $89, 10 per cent $90, 11 per cent $95, 12 per cent $100, 13 per cent $105, 14 per cent $115, 15 per cent $125, and 16 per cent $135. We now quote 7 per cent silvery iron at $79 to $84, 8 per cent $80 to $85, 9 per cent $81 to $86, 10 per cent, $82 to $87, 11 and 12 per cent $83 to $88. All prices are f.o.b. makers' furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having a uniform freight rate of $2 per gross ton for delivery in the Pittsburgh district.

Structural Material.—No important domestic jobs have been given out in this district for some time, but the American Bridge Company, McClintic-Marshall Co., and other local fabricators are booking heavy Government orders for fabricated steel work, details of which are being withheld. The Blaw-Knox Co. is executing some large contracts for fabricated steel for shipment to France. The American Bridge Co. has taken about 500 tons of bridge work for the Pennsylvania Railroad, and independent fabricators about 200 tons. We do not hear of any new sales of structural steel shapes at the Government price of 3c., as local structural mills are filled up on contracts for some months ahead, and have no material to sell on new orders for delivery in present quarter. Nominal prices in effect before the Government prices were announced are given on page 1021.

Plates.—As yet the expected order from the Government for 30,000 standard gage 8-wheel box cars has not been placed, but may come out at any time. None of the domestic railroads is placing new orders for steel cars, and the steel car companies report that deliveries of plates on orders for cars taken sometime ago, but not completed, are still very bad. There have been further small sales of sheared plates by some of the independent mills at the Government price of 3.25c. at mill, but in cases of such sales they were plates intended for other shipments, or else there were some other unusual conditions attached to sales. We quote sheared plates, ¼ in. and heavier, at 3.25c. at mill.

Steel Rails.—Nothing is being done in the way of placing orders for either standard sections or light section rails, and probably will not be until the Government announces prices on rails, which may come out at any time. Nominal prices on steel rails, both heavy and light sections, are given on page 1021.

Sheets.—As far as new buying is concerned, the sheet market is about at a standstill. The consumers of sheets figure that with sheet bars at $51, prices of sheets will be fixed by the Government very much lower than the present market, and they are naturally holding off placing orders as long as they possibly can. It is said that some sheet mills have signified their willingness to cover their most important trade for first quarter or first half of next year, the price to be left open, and to be whatever prices the Government may fix. It is said that some business has already been booked on this basis, but only to favored large customers. Nominal prices in effect on sheets, but which are probably higher than the actual market are given on page 1021.

Tin Plate.—As a result of several conferences held recently, the tin plate manufacturers have put up to the War Industries Board their proposed price of tin plate for 1918 delivery. This price has not been given out nor will it be by request of the War Industries Board, but it is understood the figure suggested by the manufacturers has been fair to them, and to consumers, and is slightly higher than the prices of tin plate in effect for last half of 1917, which were $7.50 per base box for tin plate made from Bessemer stock, and $7.75 for open hearth stock. The manufacturers are not favorable to selling their output for a year ahead owing to the uncertainty as to prices and delivery of pig tin and sheet bars, but may agree to sell for nine months or up to Oct. 1 next year. It has been carefully figured out that the world's shortage in supply of tin plate for 1918 will run from 12,000,000 to 15,000,000 boxes. It has also been determined that the entire output of tin plate in this country next year will be needed for the canning of food supplies, and that manufacturers of other products, such as tobacco, candy and other goods that have been using tin plate to pack those products, will have to use some other material. No business in tin plate has been booked by any of the mills for 1918 delivery, but several mills state that already inquiries from their trade for reservations on their books, the price to be whatever is fixed by the Government, are more than double their capacity. Prices on stock items of tin plate for prompt shipment are lower, and we quote small lots at $9 to $11 per base box at mill.

Hoops and Bands.—Possibly the Government prices to apply on hoops and bands may come out this week. In the meantime, little is developing in the way of new orders, most consumers being covered by contracts, and specifications are fairly heavy. It is believed that if the Government fixed prices on hoops and bands they will be somewhat lower than those in effect for some time. We quote hoops and bands in small lots at 4.50c. to 5c. and steel hoops at 5c., f.o.b. Pittsburgh.

Wire Rods.—The Government price on wire rods at $57, Pittsburgh, which is $9.50 above the price of soft billets, is regarded by manufacturers as very conservative, and was fully as high as expected. In fact, it is said that some large consumers of rods, notably chain makers, have been receiving a good part of their supply at about this figure or less. A local mill has made a sale of 100 tons of soft wire rods at the new price of $57, and we therefore quote soft Bessemer and open-hearth rods at $57, Pittsburgh. No differentials were fixed on high carbon rods over soft rods, but these may be given out this week.

Wire Products.—The Government is still a fairly heavy buyer of wire nails, its orders being divided among the different mills, based on their capacity, but about one-half of the total purchases of wire nails made so far by the Government have been filled by the American Steel & Wire Co., and the other half was divided among the independent mills. Domestic buying of wire and wire nails is dull, the trade waiting for the Government prices, which are expected to be lower than those of the independent mills, which are based on $4 for wire nails and $4.05 for bright basic wire. As stated before, it is believed the Government price on wire and wire nails will be somewhere between the prices of the American Steel & Wire Co., which are $3.20 for wire nails and $3.25 for bright basic wire, and those of the independent mills, which are $4 for nails and $4.05 for bright basic wire. Prices of the independent mills on wire and wire nails to domestic consumers, but at which very little new business has been done, are given on page 1021. Prices of the American Steel & Wire Co. are $16 per ton lower.

Iron and Steel Bars.—The price of 2.90c. on steel bars fixed by the Government is really only for the present quarter, being subject for revision Jan. 1. Local mills have their output of steel bars sold for some months ahead, and are not quoting the new prices for any bars to sell for this quarter delivery. It is said there have been a few small sales of steel bars by some of the smaller mills at 2.90c., but these were only small lots for prompt shipment. The new demand for iron bars is reported fairly active and prices are ruling firm. The Government has not yet indicated a price on iron bars, and former prices are still being quoted and sales made at these prices. Nominal prices in effect on both iron and steel bars are given on page 1021.

Shafting.—As yet the Government price on shafting has not been announced, but is fully expected this week. Several of the larger makers of shafting are covering their large trade through the first half of next year, prices being left open and to be fixed after

the Government announcement of prices comes out. New orders are light, being only for small lots to fill urgent need. Discounts on shafting to domestic consumers remain at 10 and 5 per cent off list. Prices on Government orders are somewhat lower. The Government has been a very heavy buyer of shafting for some months.

Railroad Spikes and Track Bolts.—New inquiry is dull for both spikes and bolts, the consuming trade holding off placing orders in view of the expected lower Government prices that may come out this week. A few contracts for standard-size spikes have lately been placed at 5c. and small lots as high as 5.50c. at mill. Nominal prices on railroad spikes and track bolts are given on page 1021. Prices on Government orders, both direct and indirect, are considerably lower.

Nuts and Bolts.—The new demand is quiet, the trade holding off for the expected Government prices, but specifications against contract are fairly active. It is said discounts which have been in effect for some time are firmly held on domestic orders, and these are given on page 1021. Prices on Government orders, which are quite heavy, are lower.

Cold Rolled Strip Steel.—There is very little buying in cold rolled strip steel, the trade holding off placing new orders in the belief that the Government will name prices somewhat lower than are now ruling in the open market. Specifications against contracts are said to be coming in at a fair rate.

On contracts, mills are quoting 9c. at mill, but on small current orders prices range from 10c. up to 12c. at mill. Terms at 30 days, less 2 per cent off for cash in 10 days when sold in quantities of 300 lb. or more.

Rivets.—Makers report there is practically no new demand, buyers holding off placing orders until Government prices come out. Very heavy orders for rivets are being placed by ship builders on Government work, which the makers are turning out and shipping as promptly as they can. Nominal prices are $5.25 per 100 lb. for structural rivets, and $5.35 for Conehead boiler rivets, f.o.b. Pittsburgh. Government prices are expected to be considerably lower.

Wrought Pipe.—The Government has not yet made any announcement of prices on iron and steel pipe, but these are expected to come out at any time. While nothing official has been given out, it is believed the new prices on both iron and steel pipe to be announced by the Government will be based largely on the card of the independent mills, issued on May 1, and which is given in detail on page 1021. The National Tube Co. has not issued a new card on steel pipe since April 1, and its prices have been $10 to $12 per ton lower than those of most of the independents.

Boiler Tubes.—The Government prices on iron and steel boiler tubes are looked for at any time, and will no doubt be considerably lower than prices that have ruled for some months. Mills rolling iron and steel tubes are filled for a long time ahead, and will have very little material to spare for delivery this quarter, so that they will not be affected particularly by the prices the Government may name.

Coke.—On the authority of R. A. Rainey, chairman of the Coke Committee of the Council of National Defense, we can state that no differential in price of foundry coke over furnace coke has been established by the Government, and that the $6 per net ton price at oven applies on both furnace and foundry coke. We have quoted in this report for several weeks a tentative price of $7 per net ton on foundry coke, but were careful to state that this was not an official price and should not have been so regarded. It is claimed that four or five of the small coke operators are still trying in various ways to evade the Government price of $6 per ton at oven, and are also getting from $8 to $9 on contracts made prior to Sept. 24 when the Government announced prices on coke. The car supply in the coke regions was bad last week, running on one or two days as low as 30 per cent of normal. One prominent coke interest states that on one day last week it did not receive a single car. We now quote standard grades of furnace and foundry coke for prompt shipment or on contracts at $6 per net ton at oven. The *Connellsville Courier* gives the output of coal and coke in the upper and lower Connellsville region for the week ending Oct. 13 as 339,002 tons, a decrease compared with the previous week of 13,449 tons.

Old Material.—Conditions in the local scrap market are absolutely without change from those noted in our report last week. On Thursday, Oct. 25, a meeting of the American Board of Scrap Dealers is to be held in this city to talk over the present situation in scrap, with special reference as to what may be done by the Government at Washington in the fixing of prices on the leading grades. Announcement of Government prices may come this week, as it is understood they were practically agreed upon at conferences held between leading scrap dealers and Government officials at Washington. The scrap committee of the American Iron and Steel Institute is said to have recommended $30 as the price for select heavy steel melting scrap, basing this on the proposition that a ton of heavy steel scrap is worth nearly as much as a ton of basic pig iron for open hearth steel-making purposes. However, it is not believed the Government will fix the price as high as $30, and some in the trade think it may be as low as $25. Consumers are holding off from buying, believing that Government prices will probably be lower than those nominally in effect now. No material is being sold by dealers to consumers, and prices are largely nominal. Dealers quote for delivery in Pittsburgh and other consuming points that take Pittsburgh freight rates, per gross ton, as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$27.00 to $28.00
No. 1 foundry cast	27.00 to 28.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md., and Franklin, Pa.	31.00 to 32.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumer's mill, Pittsburgh district	21.00 to 22.00
Bundled sheet stamping scrap	19.00 to 20.00
No. 1 railroad malleable stock	23.00 to 24.00
Railroad grate bars	16.00 to 17.00
Low phosphorus melting stock	38.00 to 40.00
Iron car axles	41.00 to 42.00
Steel car axles	41.00 to 42.00
Locomotive axles, steel	48.00 to 50.00
No. 1 busheling scrap	22.00 to 23.00
Machine-shop turnings	18.00 to 18.50
Cast-iron wheels	28.00 to 30.00
Rolled steel wheels	33.00 to 34.00
*Sheet bar crop ends	33.00 to 34.00
Cast-iron borings	19.00 to 19.50
No. 1 railroad wrought scrap	30.00 to 31.00
Heavy steel axle turnings	22.00 to 23.00
Heavy breakable cast scrap	22.00 to 23.00

*Shipping point.

Chicago

CHICAGO, Oct. 22.

The prices of pig iron are fast conforming to the level established by agreement between producers and the War Industries Board. Foundry No. 2 and basic have been sold in limited quantity at $33, furnace, without revision clauses or other reservation; while 4000 tons of Lake Superior charcoal have been sold at prices figured from the official base. The trade is anxiously awaiting definite announcement fixing base points, this apparently being the reason why certain producers are remaining out of the market, although with others it is simply because they have no iron to sell. Only in a limited way can the market for steel bars be said to be 2.90c., while no tangible evidence can be found of the possibility of procuring plates at 3.25c., despite the fact that certain mills which have avoided long term contracts are said to be approaching the time when they will actually need business. Local makers are not quoting on plates, shapes and bars, although to the best of their ability they will care for Government requirements at the official prices. The largest independent is selling no billets, sheet bars or slabs. Inquiries for many cars have come to the front. They are being figured on, but where the steel will be obtained is a question. A definite announcement on sheet prices is expected Oct. 25. The sheet market has been upset; little has been done and quotations are soft. Consumers of bolts and nuts, like sheet consumers, are waiting, likewise the melters of scrap.

Pig Iron.—An announcement from the Government officially designating price basing points for pig iron

would do much toward easing the minds of the trade. It also would make them easier to have definite information as to the official acceptance of proposed differentials. Meanwhile no inconsiderable amount of business has been done on the prices presented by a committee of the American Iron and Steel Institute to the War Industries Board. The prices referred to, which appeared in THE IRON AGE of Oct. 11, carried with them the suggestion that they should be f.o.b. cars, and furnace, and it is on this basis that many sales have been made in the past week. Some sellers, who a week ago were inserting a revision clause in their contracts covering sales made on the $33 basis, are no longer doing this, principally because of strenuous objection from purchasers. There can no longer be any question about $33 being the operative price of No. 2 foundry, at least one prominent seller freely admitting that he is taking business at $33, furnace; in limited quantity, of course, for he has not a great quantity to sell. Basic has been purchased for delivery in this territory at $33 furnace, also with no revision clause. A maker of charcoal iron has sold about 4000 tons at the price fixed by the recommended differential for this grade, or $35.50 for grades 1 to 4 inclusive, and $38 for Scotch and low silicon irons, both f.o.b., furnace. As the freight rate to Chicago is usually figured at $2, it would make these grades $37.50 and $40, Chicago, respectively. The inquiry for charcoal iron is far in excess of the tonnage available. Discussion of the question of basing points brings out several opinions, one being that the Government may be figuring on helping the freight situation by having each furnace serve its contiguous territory. On the other hand, it is pointed out that a great deal of Southern iron comes North, especially when price conditions are favorable, and that it would be unfair to make Birmingham a base, at $33, if the furnaces had to stand the $4 freight to Chicago. Again, it is argued that a Northern purchaser could buy his iron at $33, Birmingham, and himself pay the freight of $4, making his total outlay $37 per ton, but the question is asked, would he do it, if he could buy local iron at $33, furnace, plus a small freight rate? Southern furnaces are not quoting in this market, but more resale iron has changed hands at the agreed prices. The leading Northern producer has no iron to sell until after next February, though both would take care of a Government contractor armed with a Class A priority certificate. The quotations below are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton.

Lake Superior charcoal, Nos. 1 to 4	†*$37.50
Lake Superior charcoal, Nos. 5 and 6, Scotch and No. 1 soft or special	†*40.00
Northern coke foundry, No. 1	*$33.50
Northern coke foundry, No. 2	†*33.00
Northern coke foundry, No. 3	*32.50
Northern high-phosphorus foundry	*33.00
Southern coke No. 1 f'dry and 1 soft	**53.00
Southern coke No. 2 f'dry and 2 soft	**52.00
Malleable Bessemer	*33.00
Basic	†*33.00
Low-phosphorus (copper free)	*58.00
Silvery, 7 per cent	*43.00

*Agreed prices. Sales not reported, except as indicated.
†Sales made at these prices.
**Resale southern iron.

Ferroalloys. — Eighty per cent ferromanganese is now quoted at $300 for the remainder of this year and $275 for first half of next.

Plates.—Rumor is persistent that tank plates are being offered at 3.25c., the Government price, but evidence thereof is not at hand. The offerings are reported to be made by mills which avoided long term contracts so far as they were able and consequently are now in a position to take on business involving prompt deliveries. The leading interest has none to offer, neither has the leading independent, for this year, at least. The Government demand for plates seems insatiable, and it promises to grow heavier. The jobbers continue to quote their new price announced last week.

For material out of warehouse the quotation is 7c.

Bars.—A few additional sales of small lots of hard steel bars have been made at 2.90c., although the sizes are limited and the quantity available about exhausted. The makers of mild steel bars say they have none to offer, but will have some at a comparatively early date. Makers of bar iron are still quoting 4.50c. Chicago, and assert they can well afford to do so in view of their commitments. The same is true of most makers of hard steel bars who give their nominal price as 4c. to 4.25c., Chicago.

We quote warehouse prices for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4.50c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Structural Material.—The leading mills in the Chicago territory are not selling at 3c.—the official price—or at any price, unless it is for Government needs. The leading independent has enough orders to occupy its capacity for three or four months, meanwhile is not quoting. It is rumored, nevertheless, that some business has been done on the 3c. basis. No structural lettings have been made known, but there is a heavy inquiry for railroad cars. The Union Pacific is inquiring for 1000 hoppers, 1000 gondolas, 1000 box, 200 tank and 500 flat cars, 50 cabooses and 1000 logging trucks. The Western Pacific asks bids on 1000 box cars; the Illinois Central, on 1000 gondolas; the Central of Georgia, 500 box cars; the Seaboard Air Line, 500 flat cars, and the Grand Trunk on 100 refrigerator cars. In addition, the car builders are figuring on a new inquiry for 1000 cars for the United States railroad in France. In the latter country the Standard Steel Car Co. is equipping two large plants for the assembling and repair of cars, men for the purpose being drawn from various car shops in this country. Some are already on the other side and in training.

For material out of warehouse the quotation is unchanged at 5c.

Sheets.—A definite Government announcement fixing an official price for sheets is expected to appear Oct. 25. Its appearance has been delayed, and the market, in consequence, has been in a chaotic state, but nevertheless a little business has been done. The representative of an Ohio maker is submitting all inquiry to his mill and offhand does not quote. Another maker advances as the mill price for No. 28 black and No. 10 blue annealed sheets, 6c. to 7c., Pittsburgh, or 6.189c. to 7.189c., Chicago. He puts the value of No. 28 galvanized sheets at 7.50c. to 8.50c., Pittsburgh, or 7.689c. to 8.689c., Chicago. Inquiry is plentiful, but indefinite, the consumers also having their eyes on Washington. Jobbers continue to quote their slightly reduced prices of a week ago.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 9.50c.; No. 28 black, 9.25c.; and No. 28 galvanized, 10.50c.

Bolts and Nuts.—Bolt and nut interests are to hold a meeting in Pittsburgh on Wednesday of this week. A great deal of business is pending, which should be set in motion at an early date. For prices and freight rates see finished iron and steel, f.o.b. Pittsburgh, page 1021.

Store prices are as follows: Structural rivets, 5.50c.; boiler rivets, 5.60c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot pressed nuts, square, $2, and hexagon $2 off per 100 lb.; lag screws, 50 per cent off.

Cast Iron Pipe.—Berwyn, Ill., awarded 300 tons to a contractor. On 850 tons wanted by Gross Point, Ill., only one bid was submitted and as it exceeded the engineer's estimate, it was rejected. Dickinson, N. D., awarded 175 tons to a contractor. Quotations, recently fixed on the $33 pig iron basis, are unchanged.

Quotations per net ton, Chicago, are as follows: Water pipe, 4 in., $53.50; 6 in. and larger, $50.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The market continues very quiet, although there has been a little business in heavy melting steel, busheling, and turnings. Dealers are puzzled over the outcome of the inactivity of the mills. It is asked how they will fare if they wait until the usual interruptions imposed by winter on traffic. The answer

to the inactivity probably lies in expectancy that Washington will fix prices. Meanwhile scrap is none too plentiful. Repeated conferences between the War Industries Board and a committee of old material men have been held, the only public results of which so far have been rumors, which have placed the price to be fixed for heavy melting steel all the way from $25 to $30. Small lists have been issued by the Rock Island, C. B. & Q. and Soo Lines. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$36.00 to $37.00
Relaying rails	50.00 to 55.00
Old carwheels	26.00 to 27.00
Old steel rails, rerolling	34.00 to 35.00
Old steel rails, less than 3 ft.	32.50 to 33.00
Heavy melting steel scrap	26.00 to 27.00
Frogs, switches and guards, cut apart	26.00 to 27.00
Shoveling steel	23.50 to 24.00
Steel axle turnings	18.00 to 19.00

Per Net Ton

Iron angles and splice bars	$33.00 to $34.00
Iron arch bars and transoms	35.00 to 36.00
Steel angle bars	23.00 to 24.00
Iron car axles	40.00 to 41.00
Steel car axles	40.00 to 41.00
No. 1 railroad wrought	28.50 to 29.00
No. 2 railroad wrought	26.00 to 27.00
Cut forge	26.00 to 27.00
Pipes and flues	17.50 to 18.50
No. 1 busheling	19.50 to 20.50
No. 2 busheling	13.50 to 14.50
Steel knuckles and couplers	29.00 to 30.00
Steel springs	35.00 to 36.00
No. 1 boilers, cut to sheets and rings	17.00 to 18.00
Boiler punchings	30.00 to 31.00
Locomotive tires, smooth	31.00 to 32.00
Machine-shop turnings	15.00 to 15.50
Cast borings	14.25 to 15.25
No. 1 cast scrap	20.00 to 21.00
Stove plate and light cast scrap	15.50 to 16.50
Grate bars	14.50 to 15.50
Brake shoes	15.00 to 16.00
Railroad malleable	24.00 to 25.00
Agricultural malleable	20.00 to 21.00
Country mixed scrap	15.50 to 16.00

Wire Products.—In the face of the price fixed for wire rods—$57 a gross ton, (Pittsburgh)—an advance by the leading interest from its $3.20 base is looked for. Meanwhile the independents continue to quote on the basis of $4 for nails, We quote on the latter basis, to jobbers, per 100 lb. as follows:

Plain fence wire, Nos. 6 to 9, base, $4.189; wire nails, $4.189; painted barb wire, $4.339; galvanized barb wire, $5.039; polished staples, $4.339; galvanized staples, $5.039; all Chicago carload lots.

Rails and Track Supplies.—No railroad business is reported. We quote as follows, many of the prices being nominal, pending adjustment following the fixing of various semi-finished steel prices.

Standard railroad spikes, 4.50c. to 5.25c., base; small spikes, 4.75c. to 5.50c., base; track bolts with square nuts, 5.50c. to 6c., all in carloads, Chicago; tie plates, $70 to $90 f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base (nominal); open hearth, $40 (nominal); light rails, 25 to 45 lb., $70; 16 to 20 lb., $71; 12 lb., $72; 8 lb., $73; angle bars, 3.25c., base.

Cleveland

CLEVELAND, Oct. 23.

Considerable falling off in the iron-ore movement is expected this month. Weather conditions have been generally unsatisfactory. This week boats were held in port at the head of the Lakes by a severe snow storm, while there has been some freezing of ore which has delayed loading. Another cause of the decline in shipments is that boats are still being diverted from the ore to the grain trade, in which many of them will be engaged for the remainder of the season. In some cases these boats have been released voluntarily by the ore shippers. We quote prices as follows, delivered lower Lake ports: Old range Bessemer, $5.95; old range non-Bessemer, $5.20; Mesaba Bessemer, $5.70; Mesaba non-Bessemer, $5.05.

Pig Iron.—Considerable activity prevails in foundry iron, and some sales of malleable iron are also being made. Buying is in lots up to 1000 tons, mostly for the first half, although there is still some demand for iron for this year's delivery. All sales are being made at Government prices. Consumers feel that there is little possibility that the Government prices will be shaded and see no reason for deferring purchases longer, and with the growth of confidence a buying movement has sprung up. Steel-making iron is quiet, although one sale of 7500 tons of basic iron is reported by a Cleveland agency to an Ohio consumer for this year's delivery. Some 8 per cent Ohio silvery iron is being offered at $46, the Government price, for delivery during December and the first half. Alabama furnaces are not quoting in this territory, but some Tennessee iron is being offered on the basis of $33, Birmingham. Many Southern producers are far behind on deliveries and others are well sold up. Those still having iron to dispose of apparently expect to be able to sell it for shipment to the St. Louis district and nearby consuming points, and so far show no disposition to go below the $33 price to meet the competition of the Northern furnaces in Ohio territory. Complying with requests that they recommend prices on low phosphorus pig iron, makers of this grade have named $58 as a price for standard low phosphorus and $55 for copper bearing low phosphorus iron, the Government has taken no action as yet on these prices. A Valley maker has sold some standard low phosphorus iron at $60 for first half delivery and an Eastern producer is reported to have made a $55 quotation to a Pittsburgh consumer for copper bearing low phosphorus iron. We quote, delivered Cleveland, as follows:

Bessemer	$37.25
Basic	33.30
Northern No. 2 foundry	33.30
Southern No. 2 foundry, nominal	37.00
Gray forge	32.30
Ohio silvery, 7 per cent silicon	44.62
Standard low phos., Valley furnace	58.00

Coke.—Many foundries are short of coke, and it is claimed that some will be forced to shut down unless they are able to secure a supply soon. Selling agents, however, are unable to find any producer who will supply coke, all claiming that they are sold up. A Cleveland interest succeeded in purchasing during the week about fifteen carloads of Connellsville furnace coke for prompt shipment at $6 per net ton at oven.

Finished Iron and Steel.—The plate market is somewhat easier. A Cleveland mill that has been booking orders at 7.50c. since the establishment of the Government price has reduced its quotation to 7c., and an Eastern mill is offering a limited tonnage of universal plates for early delivery at the Government price, at mill, instead of using Pittsburgh as the base point. Another Cleveland mill is staying out of the market until it catches up on orders, but announces that when it makes sales it will not quote higher than the Government price. Government licenses for plates for shipment to Canada and to South America are now being freely secured, but makers are not having much success in securing licenses for shipments to Japan and other countries. A Government order for 8600 tons of ⅛-in. plates has been distributed among several mills. A Cleveland mill has received word from Washington that the Federal Trade Commission will hear arguments in favor of the cancellation of contracts made before the fixing of Government prices. This particularly interests mills under contract for semi-finished steel at high prices. There is considerable inquiry for forging steel bars for airplane work, and an Ohio manufacturer is inquiring for 1000 tons of forging billets per month for the first half of next year. Mills are asking $90 for forging billets on which the Government price has not yet been fixed. There is considerable inquiry for sheet bar contracts but some mills have none to offer. In structural lines the Pennsylvania Railroad has taken bids for 2000 tons of material for bridge work in Ohio. There is little demand for sheets except from consumers who need them for early delivery, others holding off until the Government prices are fixed. Sheet prices continue to ease off, and quotations generally range from 6c. to 7c. for No. 28 black and No. 10 blue annealed and from 7c. to 8c. for galvanized. However, one seller is quoting sheets at 5c. for black, 5.25c. for blue annealed and 7c. for galvanized, and is offering to readjust contracts at an advance of $10 per ton over Government prices when these prices are fixed. Hard

steel bars are still quoted by makers at 3.75c. to 4c. Warehouse prices are unchanged at 4.50c. to 5c. for steel bars and 5c. to 5.25c. for structural material.

Bolts, Nuts and Rivets.—A number of shipbuilding companies building boats for the Government are in the market for rivets, aggregating several thousand tons. Makers are quoting the regular prices on these inquiries and are stipulating that in case the Government regulates the price they will readjust their contracts on that basis. New demand for bolts and nuts is light, consumers apparently waiting for Government action before placing orders but no information is available as to when the Government prices will be named. Some price shading is reported on round lot inquiries. We quote 5.25c., Pittsburgh, for structural and 5.35c. for boiler rivets. Bolt and nut discounts are as follows, round lot buyers being allowed 5 to 10 per cent discount from these prices:

Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 35 off; cut thread, 30 and 5, larger or longer, 20. Machine bolts, with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 40; cut thread, 35; larger and longer, 25. Lag bolts, cone point, 40. Square h. p. nuts, blank, $1.90 off list; tapped, $1.70 off list. Hexagon, h. p. nuts, blank, $1.70 off; tapped, $1.50 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.25 off; tapped, $1 off. Cold pressed semi-finished hexagon nuts, 50 and 5 off.

Old Material.—The market is practically at a standstill. Consumers and dealers are awaiting the expected Government regulation of prices and little trading is looked for until this happens, or it is made known that there will be no regulation of scrap prices. There has been no further sagging in prices and quotations are unchanged. However, many of these are merely nominal because of the absence of sales. Material is not being forced on the market and in some cases dealers have to pay prices higher than usual quotations to secure what they need. For example, heavy steel scrap for prompt shipment brought $29.50 and a sale of cast iron was made at $25. Dealers quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$26.00 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails, under 3 ft	30.00 to 31.00
Iron rails	35.00 to 36.00
Steel car axles	45.00 to 46.00
Heavy melting steel	27.00 to 28.00
Carwheels	26.50 to 27.50
Relaying rails, 50 lb. and over	50.00 to 60.00
Agricultural malleable	22.00 to 23.00
Railroad malleable	27.00 to 28.00
Steel axle turnings	23.00 to 24.00
Light bundled sheet scrap	22.00 to 23.00

Per Net Ton

Iron car axles	$44.00 to $45.00
Cast borings	16.75 to 17.25
Iron and steel turnings and drillings	16.00 to 16.75
No. 1 busheling	22.00 to 23.00
No. 1 railroad wrought	34.00 to 35.00
No. 1 cast	23.00 to 23.50
Railroad grate bars	19.00 to 19.50
Stove plate	19.00 to 19.50

Cincinnati

CINCINNATI, Oct. 23. (*By Wire.*)

Pig Iron.—Only small sales of foundry iron have been made in this vicinity during the past week and all of this new business was booked at $33 furnace for No. 2. Southern producers are more willing to sell at this figure, although it is a rare occurrence for more than 50 or 100 tons to be ordered for last quarter. Offers are now out on first half No. 2 foundry iron on the $33 Birmingham basis, but very little iron has been sold from that territory for the delivery named. Practically all contracts for first half shipment stipulate that they are subject to the Government's revision of prices on Jan. 1. The lower grades of iron are hard to dispose of, as the furnaces do not know what prices to make on them, but on such quotations as they are issuing they are adhering to the old schedule of 50 cents a ton differential between grades. Some Northern Bessemer has lately been sold by southern Ohio furnaces at $36.30 furnace, which represents the tacit agreement on Bessemer of 10 per cent above No. 2 foundry. No basic is to be had for this year's shipment in the Hanging Rock district, but producers state that $33 would be the price quoted in case they should be able to take on any business. The inquiry for foundry iron for first half shipment is increasing and a number of fair-sized deals are under consideration by different firms. The Virginia foundry iron supply has not yet been entirely exhausted, but selling agencies report only odd lots are available for this year's movement. There is still a wide difference of opinion between producers of Ohio silvery irons and no quotations can be named just now. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, for 1917 shipment, nominal prices, as follows:

Southern coke, No. 2 f'dry and 2 soft	$33.00
Southern Ohio coke, No. 2	33.00
Basic, Northern	33.00

(*By Mail*)

Finished Material.—The warehouse price on plates, ¼-in. and heavier, has been reduced to 7c. This reduction has brought out only a small amount of business, but there is an improved call for steel bars, that are now quoted at 4.65c., although certain sizes are held at 5c. Reinforcing concrete rods are quoted at 4.70c. Structural shapes are in a little better demand and 5.15c. is now the quotation named by the jobbers. The store price on No. 10 blue annealed sheets has been reduced from 10c. to 9½c. Nearby mills are now quoting No. 28 black sheets at 7.65c. and No. 28 galvanized at 9.15c., f.o.b. Cincinnati or Newport, Ky., and sales are being made at these prices. Jobbers are not disposed to reduce wire nails below $3.90 per keg base, although there has lately been some desirable business taken at a lower rate.

Coke.—The general opinion is that producers are more willing to take on new business at the Government's price of $6 at oven. A few small foundry contracts have been made on this basis, subject to the revised Government schedule that will probably go into effect Jan. 1. Coke producers have been slower than pig-iron makers in adjusting themselves to the situation, but to a large extent they have been handicapped by natural conditions that have held up the production. So far only a few Connellsville producers have taken on any new business.

Old Material.—The past week has been very dull with dealers who are not disposed to buy scrap at any price, while consumers are indifferent as to accepting dealers' offers. Although there has been no radical change in previous quotations, the market is still very weak and shows no signs of an early recovery. The following are dealers' prices, f.o.b. cars, southern Ohio and Cincinnati.

Per Gross Ton

Bundled sheet scrap	$17.50 to $18.00
Old iron rails	32.00 to 32.50
Relaying rails, 50 lb. and up	44.00 to 44.50
Rerolling steel rails	33.00 to 33.50
Heavy melting steel scrap	24.50 to 25.00
Steel rails for melting	24.50 to 25.00
Old carwheels	25.00 to 25.50

Per Net Ton

No. 1 railroad wrought	$27.50 to $28.00
Cast borings	12.00 to 12.50
Steel turnings	12.00 to 12.50
Railroad cast	18.50 to 19.00
No. 1 machinery cast	23.00 to 23.50
Burnt scrap	13.00 to 13.50
Iron axles	40.00 to 40.50
Locomotive tires (smooth inside)	33.50 to 34.00
Pipes and flues	15.50 to 16.00
Malleable cast	19.00 to 19.50
Railroad tank and sheet	14.00 to 14.50

Philadelphia

PHILADELPHIA, Oct. 23.

The shortcomings of the Government's price control program are becoming increasingly apparent. Quite contrary to expectations that the situation would "work itself out," it is now more confused. Even official departments in Washington, the Navy, for example, does not recognize that prices have been officially fixed and its orders are placed with prices left open. A number of the large mills did not sign the so-called "gentlemen's price agreement" and accept the new prices only as a matter of policy. The unsettled condition in which the price program has been left accounts partly for the frequency with which new business is being turned down. Many of the steel mills do not know yet "where they are at" and efforts to obtain light in Washington generally reveal that officials expect steel producers to work out their own solution of various vexatious prob-

lems. One of these has been: Are mills entitled to a premium for service, such as cutting material to special sizes, and for prompt delivery out of stock? Some have interpreted the Government price control plan as giving them the right to charge extras. One mill is adding about 5c. per lb. for small lots of plates and shapes sold from stock. Another makes a charge of about $10 per ton to cover service, viz., prompt delivery. A fair tonnage of steel bars was sold by an eastern Pennsylvania mill from warehouse last week at 6c. A small mill which rolls plates from slabs has declined to accept Government orders for plates at 3.25c. and continues to accept commercial orders at 7c. to 8c. for tank quality. Even the coke makers, whose product is covered by the Lever bill, in some instances, decline to recognize that the price has been definitely fixed for coke. They say the President has made no proclamation as he did on coal and that the price of $6 at ovens, fixed at the meeting in Washington, is not an official price and not binding. The official announcement was made in the same way on coke as for prices on various steel products. A coke company has refused to deliver coke at $6 to a blast furnace in this district, which has a contract based on current price quotations, and complaint has been made to the War Industries Board and the Fuel Administrator. The Federal Trade Commission is conducting an inquiry by mail to ascertain from iron and steel producers their costs for raw material and average selling prices for their products this year. The commission also asks for views on the abrogation of all existing contracts, as suggested by Senator Pomerene, author of the bill to fix prices by law. Business, except for Government account, is almost at a standstill in this market.

Pig Iron.—The slight flurry in pig iron noted a week ago was short-lived and the past week the market has lapsed into a state of dullness. A few thousand tons of iron were sold for delivery this year and 1000 tons of foundry grades for the first half of 1918, but all of the iron for this year was in small lots and to regular customers. There are many inquiries for next year, but furnaces have become alarmed by the coke situation and several selling agents have received word from makers to make no forward commitments until further notice. One of the Warwick furnaces has been banked because of coke shortage, and other furnaces are so close to the point of exhausting their supply that they are greatly worried. Many eastern Pennsylvania furnaces are curtailing production because of coke shortage. The Norfolk & Western Railroad has lifted its embargo on pig iron shipments, but cars are not plentiful and Virginia furnaces are much behind on deliveries. Consumers in New England not engaged on Government work are declared to be suffering because of the embargo on shipments of pig iron over several Eastern roads. We quote the following tentative prices at furnace (freight rate to destination must be added):

Eastern Penna. No. 2 X	*$33.50
Eastern Penna. No. 2 foundry	33.00
Virginia No. 2 X	*33.50
Virginia No. 2 foundry	33.00
Basic	33.00
Gray forge	*32.00
Bessemer	*36.30

*Subject to revision.

Coke.—Shortage of coke is becoming very embarrassing to eastern Pennsylvania blast furnaces. The coke makers, it appears, are shipping almost 100 per cent of their production on contracts made at prices ranging from $8 to $10, and there is nothing left for the one who tries to buy at the $6 price. A furnace near here which received ample supplies of coke when prices were at higher levels cannot now obtain deliveries at $6, the official price, though its contract calls for specified quantities each month at the current quotation. The coke maker refuses to recognize the $6 price. Complaint has been made to the War Industries Board and the Fuel Administrator by the coke consumer, but without result thus far. It is learned that a coke producer has offered to ship coke to this district at $8.50 per ton at oven, but buyers have not dared to accept the offer, though they would gladly pay the price, so urgent is their need. The coke maker justifies his offer on the ground that the price of coke has not been officially fixed under the Lever bill by proclamation of the President, but that the $6 price was decided upon at the meeting of iron and steel producers with the War Industries Board in Washington and that the coke makers are not legally or morally bound by it. Meanwhile no coke is being sold in this market.

Ferroalloys.—The market for ferromanganese is weak, with very little demand. A few cars have been sold at $275 and $285 for the 80 per cent.

Sheets.—An eastern Pennsylvania mill has accepted small orders for blue annealed sheets from old customers at the price to be fixed by the War Industries Board. A little business is being done at prices approximating 7c. to 8c., Pittsburgh, for No. 10 blue annealed and No. 28 black and 9c. to 9.50c. for No. 28 galvanized. There is keen competition among sellers, however, and on a desirable order possibly below 7c. could be done. A sale of 250 tons of blue annealed sheets on the basis of 8c., Pittsburgh, is reported.

Plates and Shapes.—A small mill in this district rolling plates from slabs has declined to accept proffered Government business at 3.25c. on the ground that it is not a maker of steel. It is continuing to sell its output of plates at 7c. to 8c., Pittsburgh, for tank quality. The Lukens Steel Co. was forced to shut down its open-hearth furnace for two days last week because of a temporary gas coal famine. All plate mills report curtailed production because of shortage of fuel. Makers of plates and shapes met last Saturday in Washington, at the request of Secretary of the Navy Daniels, to confer on steel requirements for the new torpedo boat destroyer-building program. Ten mills divided the steel to be used in 150 destroyers soon to be built. About 75,000 tons of plates and sheets will be required, divided as follows: High tensile plates, 25,000 tons; 17,000 tons medium plates; 5000 tons of boiler steel and 18,000 tons of sheets. About 130 tons of shapes will be required for each destroyer, a total of 19,500 tons. Orders for rivets for the 150 ships were awarded at the same time. Large orders for the merchant ships being built by the Emergency Fleet Corporation are expected soon. One company received a specification for 8000 tons of plates last week. The tonnages of shapes and plates soon to be placed by the Emergency Fleet Corporation for its merchant fleet will fill many mills to capacity for several months and will leave practically nothing for ordinary commercial purposes. The American International Shipbuilding Corporation has asked nearly every fabricator in the East for bids on all the work it can take from Nov. 1, 1917, to May 1, 1918. These orders will be placed promptly and the shapes and plates material will be required almost immediately. Mills have received orders for plain material from the New England Structural Co. and the Boston Bridge Works, which have contracts for fabricating 5000 tons for additions to the plant of Fore River Shipbuilding Corporation for destroyer construction. The New York Shipbuilding Corporation, Camden, N. J., will require 3000 to 4000 tons also for additions for destroyer work. The Philadelphia Electric Co. will build its new plant of reinforced concrete because of inability to obtain nearby deliveries of steel. The Stone & Webster Engineering Corporation, the contractor, had asked fabricators for bids on fabrication work only and evidently had expected to be able to obtain the plain material. A leading producer of structural steel is accepting some business at the Government price of 3c., Pittsburgh, plus a service charge approximating $10 per ton for prompt delivery. Other mills selling shapes and plates in small tonnages from stock exact an even higher premium, which they maintain they are justified in charging as a recognized trade extra.

Iron and Steel Bars.—Makers of iron bars are firmly convinced that their product cannot escape Government price regulation, and hence some of them are willing to accept first-class specifications for delivery over the remainder of this year and first half of next year at 4.25c. or less. Offerings for next year at 4c. are reported. Not all mills are accepting orders at such prices, however, and 4.75c. to 5c. is freely quoted. A fair tonnage of steel bars from stock was sold a few days ago by an eastern Pennsylvania mill at 6c., Pitts-

burgh. The same mill took an order, not for Government work, for a round tonnage of concrete reinforcing bars on the basis of 2.90c. for delivery in 60 to 90 days. The Philadelphia Electric Co., which has changed plans for its new plant to reinforced concrete construction, will require about 1000 tons of reinforcing bars. We quote iron bars 4.25c., Pittsburgh, and steel bars 2.90c., Pittsburgh.

Billets and Slabs.—No sales are reported at the prices recently announced by the Government.

Old Material.—In addition to the Pennsylvania Lines East and West, the following railroads now have embargoes on shipments of iron and steel scrap and require permits, with guarantees from consignees to unload promptly: New York, New Haven & Hartford, Boston & Maine, New York Central, Erie, Pittsburgh & Lake Erie and Lehigh Valley. Business is almost at a standstill pending possible price fixing by the War Industries Board. A committee of dealers in iron and steel scrap has presented to the War Board its recommendations as to prices. Dealers point out that the price of heavy melting steel should be only slightly under that of basic iron, whereas the market may now be quoted at $25 to $28. Therefore, it is maintained, the Government has nothing to gain by fixing prices, which might be higher than at present quoted. The American Board of Iron and Scrap Dealers will thoroughly discuss the price-fixing program at a meeting in Pittsburgh on Thursday. We quote the following prices for delivery in the Philadelphia district:

No. 1 heavy melting steel	$25.00 to $28.00
Steel rails, re-rolling	30.00 to 35.00
Low phosphorus heavy melting	35.00 to 38.00
Old iron rails	38.00 to 40.00
Old carwheels	29.00 to 31.00
No. 1 railroad wrought	35.00 to 40.00
No. 1 forge fire	22.00 to 23.00
Bundled sheets	22.00 to 23.00
No. 2 busheling	15.00 to 16.00
Machine shop turnings (for blast furnace use)	15.00 to 16.00
Machine shop turnings (for rolling mill use)	18.00 to 20.00
Cast borings (for blast furnace use)	15.00 to 16.00
Cast borings (clean)	19.00 to 20.00
No. 1 cast	28.00 to 30.00
Grate bars	19.00 to 21.00
Stove plate	19.00 to 21.00
Railroad malleable	32.50 to 35.00
Wrought iron and soft steel pipes and tubes (new specifications)	28.00 to 30.00

British Steel Market

American Crude Steel Easier—Ferromanganese Scarce—Pig Iron Stronger

(*By Cable*)

LONDON, ENGLAND, Oct. 24.

The demand for pig iron is strong and is stimulated by the suggestion that an advance in coal prices will involve an all around revision of maximum iron quotations. American semi-finished steel is easier. Wire rods have sold down to £27 c.i.f. Liverpool, with £26 the nearest price now. Tin plates are firmer. Ferromanganese is unsettled and irregular, small business having been done at about $350 c.i.f. American Atlantic ports for forward shipment, but sellers are very scarce. We quote as follows:

Tin plates, coke, 14 x 20; 112 sheets, 108 lb., f.o.b. Wales, maximum, 30s.
Ferromanganese, £45 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.
On other products control prices are as quoted in THE IRON AGE of July 19, p. 171.

Buffalo

BUFFALO, Oct. 22.

Pig Iron.—Inquiry continues good and some improvement is shown in the amount of business transacted as compared with a week ago, although the amount iron furnaces have to dispose of is exceedingly limited, even for the period of the first quarter of next year, with practically nothing left to sell for delivery during the remainder of this year. Some furnaces have capacity pretty well taken until next Fall. The bulk of the business consummated during the week was for delivery over the first four months of 1918, and was principally with regular customers, those who have been constant buyers from one source of supply for years, and who, furnacemen feel, are entitled to consideration in purchasing because of the regularity with which their orders have been placed in the past. With the present well booked up conditions, producers are not pushing sales, although business may be more freely sought when price differentials for all grades have been definitely established and the coke situation is straightened out. The most notable sale of the week was a tonnage of about 5000, comprised of No. 2 plain, No. 2 X and No. 1 foundry, for which the prices were on a basis of $33.00, furnace, for the No. 2 plain, $33.50 for 2 X and $34.50 for No. 1 foundry. This transaction, as well as some others covering much smaller tonnages, was made with the understanding between seller and buyer that in the event of the Government differentials not corresponding to this basis, the prices for the sale are to be changed to conform to the Governmental scale. The following is the approximate schedule of prices f.o.b. furnace, on which current business is being transacted. The price scale is approximately as follows, f.o.b. furnace, Buffalo:

No. 1 foundry	$34.50
No. 2 X	33.50
No. 3 foundry	32.50
Gray forge	32.00
Malleable	33.50
Basic	33.00
Lake Superior charcoal, f.o.b. Buffalo	39.75

Old Material.—Buying and selling continues at a standstill, held in abeyance waiting the expected fixing of prices by the Government, which is still delayed. Meanwhile lower price levels are in evidence, due to lack of any buying movement because consumers are holding back. Consumers' stocks are said to be running low, which will undoubtedly necessitate the buying of additional supplies shortly. The principal changes shown in price schedules for the week are: a drop in heavy melting steel of $1.50 to $2.00 per ton, the nominal price now being $28.00 to $30.00; a decline of $3.00 per ton in No. 1 railroad wrought, of $2.00 per ton in old iron rails, and $1.00 per ton in No. 1 machinery cast scrap, railroad malleable and heavy axle turnings.

We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel	$28.00 to $30.00
Low phosphorus	41.00 to 42.00
No. 1 railroad wrought	37.00 to 38.00
No. 1 railroad and machinery cast	28.00 to 29.00
Iron axles	45.00
Steel axles	45.00
Carwheels	30.00 to 31.00
Railroad malleable	28.00 to 29.00
Machine shop turnings	17.00 to 18.00
Heavy axle turnings	25.00 to 26.00
Clean cast borings	19.00 to 20.00
Iron rails	38.00 to 39.00
Locomotive grate bars	20.00 to 21.00
Stove plate	20.00 to 21.00
Wrought pipe	26.00 to 27.00
No. 1 busheling scrap	25.00 to 26.00
No. 2 busheling scrap	17.00 to 18.00
Bundled sheet stamping scrap	19.00 to 20.00

St. Louis

ST. LOUIS, Oct. 22.

Pig Iron.—Inquiry in the local market has continued heavy, but so far transactions have been held up by absence of certainty as to prices for the deliveries wanted as well as the unwillingness of furnaces to make sales while current deliveries were still behind contract allotments. The inquiry of the Scullin Steel Co. for 20,000 tons of basic, southern product, and of the Commonwealth Steel Co. for 10,000 tons northern basic are in this category. The inquiries continue to come from sections not hitherto considered. St. Louis territory and about 10,000 tons in the aggregate in lots of 1000 tons and downward have been asked for from Chicago territory, the apparent hope being that the local furnace could meet the call. A considerable inquiry mentions no specific tonnage, the desire probably being to get a price. According to reports in the market during the past week, offers have been received for Dec. 1 to July 1 delivery by a number of consumers from the Rockwood furnace at $33.50 Birmingham basis for No. 2 foundry.

Finished Iron and Steel.—In finished products no

business is being done, though there is constant pressure for delivery. On stock out of warehouse we quote as follows: Soft steel bars, 4.55c.; iron bars, 4.50c.; structural material, 5.05c.; tank plates, 7.05c.; No. 10 blue annealed sheets, 9.55c.; No. 28 black sheets, cold rolled, one pass, 9.25c.; No. 28 galvanized sheets, black sheet gage, 10.50c.

Old Material.—The scrap market has been rather quiet, though there has been some stiffening of rolling mill grades because of the needs of local industries. There is also need for steel for the open hearth furnaces, whose stocks of scrap are considerably depleted, and firmer feeling is being experienced. We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district, as follows:

Per Gross Ton	
Old iron rails	$36.00 to $37.00
Old steel rails, re-rolling	35.00 to 35.50
Old steel rails, less than 3 ft.	29.00 to 30.00
Relaying rails, standard section, subject to inspection	50.00 to 55.00
Old car wheels	25.50 to 26.00
Heavy melting steel scrap	26.50 to 27.00
Heavy shoveling steel	24.00 to 24.50
Ordinary shoveling steel	20.50 to 21.00
Frogs, switches and guards cut apart	24.50 to 25.00
Ordinary bundled sheet scrap	17.50 to 18.00
Heavy axle and tire turnings	17.00 to 17.50

Per Net Ton	
Iron angle bars	$33.50 to $34.00
Steel angle bars	23.50 to 24.00
Iron car axles	40.50 to 41.00
Steel car axles	39.00 to 39.50
Wrought arch bars and transoms	39.50 to 40.00
No. 1 railroad wrought	29.50 to 30.00
No. 2 railroad wrought	27.50 to 28.00
Railroad springs	25.50 to 26.00
Steel couplers and knuckles	27.50 to 28.00
Locomotive tires, 42 in. and over, smooth inside	29.50 to 30.00
No. 1 dealers' forge	18.00 to 18.50
Cast iron borings	14.00 to 15.00
No. 1 busheling	21.00 to 21.50
No. 1 boilers, cut to sheets and rings	16.50 to 17.00
No. 1 railroad cast scrap	19.00 to 19.50
Stove plate and light cast scrap	16.50 to 17.00
Railroad malleable	25.50 to 26.00
Agricultural malleable	18.50 to 19.00
Pipes and flues	19.50 to 20.00
Heavy railroad sheet and tank scrap	15.50 to 16.00
Railroad grate bars	16.00 to 16.50
Machine shop turnings	14.50 to 15.00
Country mixed scrap	14.50 to 15.00

New York

NEW YORK, Oct. 24.

Pig Iron.—Very active inquiry for pig iron has developed, inquiries amounting to probably 10,000 tons of foundry iron for delivery of all kinds, from prompt to well into next year. The largest was for 2000 tons and most of them were for 200 to 300 tons. While some sales have been made on the basis of Government prices, sellers as a rule are very conservative and in many cases are refusing to quote until the policy of the Government becomes more plainly defined. No action has yet been taken in regard to recommendations submitted to Washington week before last, but word from the Capital is expected in the very near future. For early delivery, we quote as follows, tidewater, for those grades for which prices have been fairly established, omitting other grades for the present:

No. 1 X	$35.25
No. 2 X	34.25
No. 2 plain	33.75
No. 2 Southern	37.25

Ferroalloys.—Domestic ferromanganese has been sold in small lots at $275, but it is believed that an inquiry involving an attractive amount would bring out a lower price. The cause of the decline from $350 in the last few weeks is not clear. Some attribute it to the expectation of price-fixing and a desire to unload higher priced material. The possibility of the Government fixing a price on ferromanganese is not now regarded very seriously, since the ore is a foreign product almost entirely and not subject to regulation, its price largely determining the price of the alloy. Inquiry is of small proportions and consumers seem well provided for. Imports in September were 3402 tons, but indications now are that for the remainder of the year they will be less than in some recent months. One representative of an English producer is quoting $275, seaboard, for delivery next year. This producer was able to secure licenses for the shipment of only 400 tons out of 1500 tons asked to be released. There is an inquiry from a Middle Western consumer for 12,000 tons of 20 per cent spiegeleisen for delivery in 1918 at the rate of 1000 tons per month. There is no quotation for this position available, but for delivery this year $70, furnace, is asked and has been obtained on small lots. Ferrosilicon, 50 per cent, is quiet, with about $200 asked for delivery this year and $150 to $165 for next year's material. There is an inquiry before the market for 1200 tons for 1918 delivery at 100 tons per month.

Cast Iron Pipe.—Following the reduction of $9 per ton in prices of cast iron pipe, making the quotation $56.50 on 6-in. and heavier and $59.50 on 4-in., there has been little inquiry. This is the period of the year when cast iron pipe is almost always dull, and the dullness is pronounced this year. The Government is taking some pipe, principally for delivery at shipyards, as the requirements of the cantonments are well covered. Buyers are hesitating. They probably are hopeful of still lower prices being made.

Old Material.—Buyers and sellers of scrap have their eyes turned toward Washington and are awaiting action of representatives of the scrap dealers and Government officials in regard to prices. Under these conditions very little business is being transacted and dealers are having difficulty in getting cars in which to move the limited tonnages sold. We quote prices of brokers as follows to New York producers and dealers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$23.50 to $24.00
Old steel rails (short lengths) or equivalent heavy steel scrap	23.50 to 24.00
Relaying rails	45.00 to 50.00
Rerolling rails	33.00 to 34.00
Iron and steel car axles	41.00 to 42.00
No. 1 railroad wrought	32.00 to 33.00
Wrought-iron track scrap	27.00 to 28.00
No. 1 yard wrought long	27.00 to 28.00
Light iron	7.00 to 8.00
Cast borings (clean)	16.00 to 17.00
Machine-shop turnings	14.00 to 15.00
Mixed borings and turnings	13.00 to 14.00
Wrought-iron pipe (1 in. minimum diameter, not under 2 ft. long)	25.00 to 26.00

The cast scrap market is showing some improvement and quotations on No. 1 machinery cast and stove plate are somewhat higher. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$26.00 to $27.00
No. 1 heavy cast (column, building materials, etc.)	21.00 to 22.00
No. 2 cast (radiators, cast boilers, etc.)	21.00 to 22.00
Stove plate	18.00 to 19.00
Locomotive grate bars	16.00 to 17.00
Malleable cast (railroad)	27.00 to 28.00
Old carwheels	27.00 to 28.00

Finished Iron and Steel.—Some specific stock orders of plain structural material with deliveries extending in 1918 have been taken at the 3c., Pittsburgh basis, and this is about all of the sizable transactions at the new prices. In the Chicago territory 10,000 tons of steel bars were sold at 2.90c. for the last of this year and through the first quarter of next. Other movement of material has been largely from the so-called boneyards of mills, small in amount, of course, and chiefly in plates, which have been moved at 8c. per lb. Universal plates are obtainable for immediate shipment at 3.25c., Pittsburgh, but sheared mills are giving 85 per cent of their present rollings to Government uses, leaving still no apparent chance for any nearby delivery purchases in tank or hull plates outside of even the A classification. Seekers after plates are still offering to pay more than 3.25c. without success. Bar iron is strong at 4.75c., Pittsburgh, with perhaps somewhat better delivery than latterly obtaining and thus attracting some business which would otherwise go to steel bar mills. On 5000 tons of rails for China a quotation at $80 per ton has been made. In railroad cars neither the 30,700 for Russia nor the 10,000 for France, mentioned last week, have been closed. The delay in the former case seems to be the result of an effort to secure lower prices. A sizable domestic inquiry has appeared from the Union Pacific for 3750 cars and 1000 trucks, but whether or not this is a feeler for lower prices

growing out of the lower agreed steel prices, or whether it is business likely to be soon closed is not certain. In the fabricating field awards may be noted as follows: 1500 tons for the Philadlephia & Reading, Philadelphia, to the McClintic-Marshall Co.; 1900 tons for the nitrate plant at Sheffield, Ala., to the Virginia Bridge & Iron Co.; 200 tons for the model storage building, Department of Yards and Docks, Washington, to Barber & Ross, and 1100 tons for the Pennsylvania, of which 700 tons went to the American Bridge Co. So far as business in Eastern territory is concerned the agreed prices of 2.90c. on steel bars, 3c. on shapes and 3.25c. on tank plates are nominal, but for mill shipments of iron bars we quote 4.945c., New York. Out of store we continue to quote shapes and iron and steel bars at 5c. to 5.50c., New York, and plates at 8c. and higher, with a possibility that 7c. might be done.

Plates and Shapes for New Destroyers

WASHINGTON, Oct. 23.—About eleven steel manufacturers will participate in the supplying of plates and shapes for the construction of the 150 destroyers for which the Navy Department has contracted. The names of these manufacturers and the quantity of steel which each is to furnish at the prices recently fixed by the Government are withheld. Secretary of the Navy Daniels, some time ago, announced the names of the five shipyards which will construct the destroyers. The speed with which the arrangements for the building of the vessels and the distribution of the steel orders were accomplished is looked upon by officials here as satisfactory evidence of the amicable arrangements which have been worked out between the Government and the producers of such products.

The shipbuilders conferred with Secretary Daniels early in the month and the orders for the destroyers were distributed thereupon. The representatives of the eleven leading steel companies conferred with the Secretary on Saturday last and thereupon the orders for the ship plates and shapes were distributed. Admiral Taylor, Chief Naval Constructor, participated in the Saturday conference. The steel to be used in the construction of the destroyers, it has been estimated, will aggregate 75,000 tons.

Before deliveries are to be started, Admiral Taylor's office is waiting upon the five shipbuilders for a detailed schedule. This schedule will give the order of deliveries of the steel supplies for the construction of the destroyers. The steel producers will be called upon to make deliveries in accordance with these schedules from the builders of the destroyers. In order to inforce early delivery of the supplies to the builders in the order called for in the schedules, it is expected the Priorities Committee will be called upon to issue the necessary certificates of prior delivery. While these certificates may not be necessary, inasmuch as the steel producers have promised hearty co-operation, they will serve as a legal protection to the steel men against any claims which may result from delays resulting therefrom to other orders which must be displaced to meet the needs of the Navy program.

The Warren Metal Co., Warren, Ohio, dealer in iron and steel scrap, metals and waste, has sold one of its yards and purchased a larger site for a new yard in the southeast section of Warren, between the tracks of the Baltimore & Ohio and Erie railroads. The company will equip the new yard with modern equipment and railroad track scales. The company has also leased a suite of offices in the New Hippodrome Building, Warren. It will specialize in carload lots of old material. The Warren Metal Co. was incorporated May 1, 1917, with $50,000 capital stock. Its officers are: Jacob Knofsky, president; Isador Knofsky, vice-president; I. L. Knofsky, secretary; F. D. Williams, treasurer, and Roy Knofsky, general manager.

P. M. Armstrong & Co., conducting one of the oldest hardware stores in Lisbon, Ohio, has retired from business. The company was originally organized more than 60 years ago by the late R. B. Pritchard, but since 1883 has been conducted by Armstrong & Co.

Absorbs Canton Sheet Steel Co.

The Hydraulic Pressed Steel Co., Cleveland, has acquired control of the Canton Sheet Steel Co., Canton, Ohio, as a result of negotiations which were concluded last week. It is understood that approximately $4,000,000 was involved in the transaction, of which about one-half was paid in cash. By the purchase of the Canton plant the Hydraulic company has secured its own source of supply for raw material. The plant of the Canton Sheet Steel Co. has a capacity of about 90,000 tons in black and galvanized sheets per year and the company is installing a steel plant to manufacture its own sheet bars. This consists of three open-hearth furnaces and a continuous sheet bar and billet mill. The open-hearth plant will be ready for operation in about three weeks. The Hydraulic company, with its Cleveland subsidiary, the Cleveland Welding & Mfg. Co., expects eventually to consume the entire output of the Canton plant with the exception of the galvanized sheets. However, as long as it has a surplus product it will be disposed of in the market.

The reorganization of the Canton Sheet Steel Co. has been affected by the election of J. H. Foster, A. W. Ellenberger, H. P. McIntosh, Jr., S. H. Tolles and E. I. Heinson as directors, who succeed a majority of the old board. The following Canton men remain on the board: C. A. Irwin, W. W. Irwin and H. S. Renkert. J. H. Foster, president of the Hydraulic company, will be president of the Canton company, C. A. Irwin first vice-president, H. S. Renkert second vice-president, H. P. McIntosh, Jr., treasurer and S. H. Tolles secretary. W. W. Irwin, who organized the Canton company and has been at its head, remains as general manager.

The product of the Hydraulic Pressed Steel Co. includes heavy pressed steel work, automobile frames, stampings, pressed steel concrete structural forms and steel barrels. This company also has a large shell department and has been engaged since the outbreak of the war in making shell forgings, and is now doing a large amount of this work for the United States Government. The products of the plant of the Cleveland Welding & Mfg. Co. include automobile rims, truck tire bases and welded steel tubing.

British Production of Stainless Steel Prohibited

The production of stainless steel for cutlery in Great Britain has been prohibited by an order of the Ministry of Munitions, Sept. 8, 1917. The order reads as follows:

> In view of the difficulties in getting supplies of ferrochrome I am directed to inform you that from the above date the use of the same in connection with the manufacture of stainless steel for cutlery purposes is prohibited. Ferrochrome must only be used in connection with high speed, crucible carbon steel and alloy steel and, in the case of the latter, only where a priority certificate or other permit number has been obtained which will warrant the manufacture of the steel in question.

As will be seen, the prohibition relates only to stainless steel for the cutlery trade and, therefore, such steel can still be made for other uses providing that these are connected with the production of munitions of war. That such uses exist is not generally known, but it appears that the material has proved extremely valuable for various engineering purposes, says an English authority. Apart from cutlery, steel rendered stainless or rustless by the employment of chromium in its composition is likely to become a big factor in the engineering industry of the future.

The Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., in an illustrated pamphlet, announces courses to be given in the technical night school conducted for its employees. The subjects include machine shop practice, blueprint reading, shop drawing and mathematics, practical electricity and shop mechanics. The success with which the initial term met last winter, it is stated, was greater than the management had dared to hope for. A registration fee of $1 is refunded to each man awarded a certificate at the end of the season, and a textbook is supplied at cost.

IRON AND INDUSTRIAL STOCKS

Decline on Wall Street Stopped—Many Gains Are Recorded

NEW YORK, Oct. 24, 1917.

The decline in prices on the Stock Exchange which had been in progress for many weeks was stopped last week and nearly all industrial stocks recorded advances. At the beginning of the week depression was more decided than on any other day since the declaration of war by the United States, but the upward movement soon got under way and throughout the rest of the week sentiment was decidedly stronger. There is a feeling that the liquidation, due to the new revenue bill and the Liberty Loan, has been about finished and as it is not expected that a third Government bond issue will be launched this year, the prospect of a strong stock market up to Jan. 1 is much improved, but the ease with which the market may be depressed was shown by a violent break which took place the early part of last week, due to the suggestion that measures might be taken to close the Stock Exchange on account of the long continued descent of prices.

Among the stocks which recorded gains last week were the following: Allis-Chalmers Mfg. Co., com., 2⅜ points; American Car & Foundry Co., 2¾; American Steel Foundries, 2⅜; Baldwin Locomotive, com., 6⅞; Bethlehem Steel, 10; Bethlehem Steel, class B, 9½; Bethlehem Steel, pref., 9; Lackawanna Steel, 4¾; Midvale Steel, 4; National Enameling & Stamping, com., 3⅜; Pressed Steel Car, 3; Republic Iron & Steel, com., 4½; Sloss-Sheffield Steel & Iron, 2; Superior Steel, 2⅞; United States Steel, com., 3⅞; United States Steel, pref., 1⅝.

The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	19¾ - 23½	Int. Har. of N. J., pref	100 -110
Allis-Chal., pref.	74 - 75½	Int. Har. Corp., com.	65⅜
Am. Can, com.	38½ - 42⅞	Lacka. Steel	76 - 84
Am. Can, pref.	94⅞ - 96¼	Lake Super. Corp.	12⅝ - 14⅜
Am. Car & Fdy., com.	63 - 69⅜	Lukens, 1st pref.	101½ - 101¾
Am. Car & Fdy., pref.	107½	Midvale Steel	43⅞ - 47⅝
Am. Loco., com.	53 - 61⅞	Nat.-Acme	29⅞ - 30¾
Am. Loco., pref.	97 - 98	Nat. En. & Stm., com.	41¼ - 45
Am. Rad., com.	292	N. Y. Air Brake.	115 -123
Am. Ship, com.	89 - 89½	Nova Scotia Steel	78 - 80
Am. Steel Fdries.	58½ - 63⅝	Pitts. Steel, pref.	97
Bald. Loco., com.	51 - 65¼	Pressed Stl., com.	52½ - 59½
Bald. Loco., pref.	95¾ - 96¼	Ry. Steel Spring, com.	38⅞ - 42½
Beth. Steel, com.	74 - 89	Ry. Steel Spring, pref.	95¼ - 97⅞
Beth. Steel, Class B	71 - 87¼	Republic, com.	72⅜ - 81⅞
Beth. Steel, pref.	92 - 93	Republic, pref.	98 - 99¼
Cambria Steel	105 -116	Sloss, com.	37½ - 42
Carbon St., com.	73 - 77	Superior Steel	33¾ - 38⅝
Central Fdry., com.	28 - 30¼	Superior Steel, 1st pref.	100
Central Fdry., pref.	44	Transue-Williams	39 - 40
Chic. Pneu. Tool.	56 - 57	Un. Alloy Steel.	39½ - 41¾
Colo. Fuel	35⅛ - 40	U. S. Pipe, com.	12¾ - 14
Crucible St., com.	62¾ - 69⅞	U. S. Pipe, pref.	50 - 50¼
Crucible St., pref.	90½ - 91½	U. S. Steel, com.	100⅞ - 107⅜
Deere & Co., pref.	99¾	U. S. Steel, pref.	112⅞ - 114⅝
Gen. Electric	135¾ - 139⅜	Va., I. C. & Coke.	55 - 58½
Gt. No. Ore. Cert.	27 - 29¾	Westing. Elec.	40¾ - 44
Gulf States Steel.	90½ - 95		
Int. Har. of N. J., com.	103½ - 107		

Republic's Fine Showing

Out of total income of $23,502,521 for the first nine months of the current year the Republic Iron and Steel Co. has laid aside $8,636,605 to cover the full estimated amount of accrued excess profits and income tax for the year to date, according to an official statement just issued by John A. Topping, chairman of the board.

Net profits available for dividends were $13,045,338, and after allowing for the dividends on the preferred, the balance available for the $27,191,000 common stock was equivalent to $43.26 a share. During the nine months' period the company expended $2,467,130 for maintenance charges and repairs.

In his remarks to the stockholders Mr. Topping said: "This statement is submitted in lieu of the usual quarterly statement for the period ended Sept. 30, 1917, to clarify operating results to date. The net profits applicable to dividends for the quarter ended Sept. 30, 1917, calculated on the previous basis of accounting, would have been $6,682,425. The foregoing statement is subject to adjustment at the end of the year, when accounts are finally audited. Our fiscal year ends Dec. 31, and the annual report will be published prior to the annual meeting, which occurs in April."

The income account is as follows:

Net earnings after deducting $2,467,130 for maintenance and repairs		$23,311,988
Other income—interest and dividends		190,533
Total income		$23,502,521
Depreciation and renewal	$737,152	
Exhaustion of minerals	202,585	
Extraordinary depreciation	300,000	1,239,737
Net profits for nine months		$22,262,784
Bond interest	580,841	
Excess profits tax, etc.	8,636,605	9,217,447
Net profits for dividends		*$13,045,338
Preferred dividends	1,312,500	
Common dividends	1,223,595	2,536,095
Surplus for nine months		$10,509,243

*After allowing for dividends on the preferred stock, the balance available for the $27,191,000 common stock is equivalent to $43.26 a share.

Industrial Finances

The American Brass Co., Waterbury, Conn., has declared an extra dividend of 4½ per cent in addition to its regular quarterly dividend of 1½ per cent. Explanation is made that the directors believe that it is their duty to conserve their financial resources against the time when they will be called upon to pay large amounts which will be due the United States Government for excess profits and for income taxes, and to Connecticut and Wisconsin for state taxes.

Dividends

The Canadian Foundry & Forgings Co., quarterly, 3 per cent on the common and 1¾ per cent on the preferred, payable Nov. 15.

The Crocker-Wheeler Co., quarterly, 2 per cent on the common and extra 1 per cent. and quarterly, 1¾ per cent on the preferred, all payable Oct. 15.

The Dominion Steel Corporation, quarterly, 1½ per cent on the preferred, payable Nov. 1.

The Lima Locomotive Co., initial semi-annual of 3½ per cent on the preferred, payable Oct. 31.

The Taylor-Wharton Iron & Steel Co., quarterly 1¾ per cent, payable Nov. 1.

The Warwick Iron & Steel Co., 30c. per share, payable Nov. 15.

Nova Scotia Steel & Coal Co. Production

The output of the Nova Scotia Steel & Coal Co., New Glasgow, N. S., for the three months of July, August and September compares with that of the previous quarter as follows:

	June Quarter. Tons	September Quarter. Tons
Coal	152,076	139,796
Ore	4,238	7,174
Limestone	20,890	17,069
Coke	25,874	25,268
Pig iron	21,971	21,874
Steel ingots	33,377	30,847
Finished steel and forgings	28,908	32,657

An examination for inspector of supplies and repairs has been announced by the Municipal Civil Service Commission, New York. Candidates should have practical experience in the purchasing, storage, inspection or handling of supplies required in the city service or experience in building construction and repairs or related experience tending to qualify them for the duties of the position. The salary is $1,800 to $2,400 per year. Applications will be received at room 1400, Municipal Building, New York, until Nov. 2 at 4 p. m.

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
Oct.	Lake	Electro-lytic	New York	New York	St. Louis	New York	St. Louis
17	23.50	23.50	61.25	6.90	6.77½	8.25	8.00
18	23.50	23.50	61.25	6.50	6.37½	8.25	8.00
19	23.50	23.50	61.50	6.40	6.27½	8.25	8.00
20	23.50	23.50	....	6.40	6.27½	8.25	8.00
22	23.50	23.50	61.50	6.25	6.12½	8.25	8.00
23	23.50	23.50	61.62½	6.25	6.12½	8.25	8.00

NEW YORK, Oct. 24.

Dullness pervades all the markets. Copper continues unsettled and nominal at the Government price. Tin is quiet and firm. Lead continues to decline with no demand. Spelter is still stagnant and unchanged. Antimony is weaker.

New York

Copper.—That copper has sold in small lots as high as 30c., New York, is acknowledged. That no copper can be bought in quantity from large producers at the Government or any other price is a certainty. These are the only two facts that are definitely known in a market concerning which other reliable or official information is almost impossible to obtain. It is stated that the general situation is working out satisfactorily and that consumers having Government contracts are getting supplies on old contracts. The position of the small dealer is the difficult one, faced as he is with the rumor that sales made above the Government price are liable to confiscation. The entire situation depends on how much copper is left after the war needs are supplied. We continue to quote the Government price as nominal at 23.50c., New York, for both Lake and electrolytic. The London market is unchanged.

Tin.—The leading fact of interest in the tin market is that indications point in some respects to easier shipping permits. Nothing definite is known about this but the feeling is based on a belief that the American and British governments have reached an understanding so as to make deliveries easier. It is recognized that tin-plate manufacturers must have tin to make tin plate for cans. The market was very dull in the last three days of last week, the earlier good demand having flattened out. Monday the market was nominal and on Tuesday it was practically the same, although a moderate business in futures was quietly done. At the close of business yesterday also there was more interest in futures which may later develop into good business. The market has been firm, fluctuating close to either side of 61.50c., New York, with the quotation yesterday, 61.62½c. Arrivals to Oct. 23 inclusive, were 1910 tons, with 4300 tons reported afloat. The London market for spot straits is only 5s. under its level last week, or £247 5s. per ton.

Lead.—Another reduction on Thursday of last week by the American Smelting & Refining Co. of ½c. per lb., bringing its quotation to 6.50c., New York, has further unsettled an already weak and inactive market. The quotation yesterday was 6.25c., New York, in the outside market. The bottom has apparently not yet been reached, but it is believed it is near. Independents continue to cut the leading producer's price and are now asking 6.40c., New York, for prompt lead, 6.25c., New York, for October and November delivery, and 6c., New York, for December. A fair amount of lead has been sold in transit, but it did not command a premium, which is unusual. Buyers in general are ordering only what they need and what they can quickly lay their hands on.

Spelter.—Inquiry is only spasmodic and not for large amounts in any case. The market is lifeless and discouraged. Buying for the galvanizing trade has dwindled to small proportions compared with what it was before the war. Brass manufacturers are not in the market, whereas a year ago they were covering their requirements for large quantities a year ahead. If our own Government has made any plans for its own ammunition, it is not reflected in the spelter market. If Government price-fixing is decided on, it is believed it will ultimately result in higher prices, for present quotations are very near cost levels. Price fixing would be, however, a temporary burden. The market for prime Western is quoted nominally at 8c., St. Louis, or 8.25c., New York, for early delivery, but this can probably be shaded on desirable inquiries. For later delivery ⅛ to ¼c. higher is asked. Transactions are reported as very few.

Antimony.—Because of lack of demand the market has declined and Chinese and Japanese grades are obtainable for 14.75c., New York, duty paid.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is inactive and unchanged at 38c. to 40c. per lb., New York, for early delivery.

Old Metals.—We are quoting nominally on the basis of the Government arrangement with the producers, but purchasers other than the Government are obliged to pay from 26c. to 27c. per lb. for heavy crucible copper. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible (nominal)	23.50
Copper, heavy and wire (nominal)	23.50
Copper light and bottoms	22.50 to 23.00
Brass, heavy	18.00 to 18.25
Brass, light	13.00 to 14.00
Heavy machine composition	25.00 to 25.25
No. 1 yellow rod brass turnings	17.25
No. 1 red brass or composition turnings	19.00 to 21.00
Lead, heavy	6.25
Lead, tea	5.00
Zinc	6.25

Chicago

OCT. 22.—In copper there is no general market, each individual transaction determining its own price. The fulfilment of contracts is being permitted by the Government, and it is interesting to note that up to 32c. figures in some of these. Buying is sparse in all the metals, most of it being hand-to-mouth business, although there is some effort being made to buy future lead and spelter, certain consumers believing that these metals have touched the bottom. Activity is restrained by the difficulty, if not impossibility, of finding sellers of futures. The official maximum price on copper has operated to bring old metals down sharply. We quote as follows: Casting, Lake and electrolytic copper, 28c. to 30c.; tin, carloads, 62c.; small lots, 64c. to 65c.; lead, 6.45c.; spelter, 8c.; sheet zinc, 19c.; antimony, 17c. to 18.50c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible wire, crucible shapes, 20c.; copper clips, 20c.; copper bottoms, 19c.; red brass, 19c.; yellow brass, 14.50c.; lead pipe, 5c.; zinc, 5.50c.; pewter, No. 1, 35c.; tinfoil, 42c.; block tin, 47c.

St. Louis

OCT. 22.—Non-ferrous metals have been rather quiet, with a weaker tendency. The close to-day on lead in carload lots was 6.42½c., with no business reported; spelter in carload lots, dull at 8c. In less than carload lots the quotations were: Lead, 7.90c.; spelter, 9c.; tin, 65½c.; Lake copper held at 28c.; Asiatic antimony, 18c. In the Joplin district ore was generally weaker. Zinc blende was held on a range, basis of 60 per cent metal, at $55 to $70 per ton, with some special lots, on premium analysis, going higher. The average for the week for the district was $66 per ton. Calamine was $35 to $42, basis of 40 per cent metal, with the average for the district for the week $39 per ton. Lead dropped from $90 to $80 per ton, basis of 80 per cent metal, with the average for the week at $84 per ton. About seventy-five plants have shut down because of the price conditions.

J. M. Faris of the Youngstown Sheet & Tube Co. recently made an address before the Rotary Club of that city on "Increased Production as Effected at the Plants of the Youngstown Sheet & Tube Co." Starting with the old style skelp mill with its capacity of possibly 10,000 tons per month, its force of 200 employees or more, Mr. Faris spoke of the modern skelp mill of today at Youngstown, which can turn out 17,000 tons of skelp per month with a force of only 40 men.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

(Some of these quotations are nominal, showing prices which prevailed when last sales were made. Published as a matter of record.)

Freight rates from Pittsburgh on iron and steel articles, aside from wrought iron and steel pipe in carloads, per 100 lb. New York 19.5c.; Philadelphia 18.5c.; Boston 21.5c.; Buffalo 11.6c.; Cleveland 13.5c.; Cincinnati 18.5c.; Indianapolis 20c.; Chicago 21.5c.; St. Louis 27c.; Kansas City 47c.; minimum carload 36,000 lb.; St. Paul 35.5c; minimum carload 36,000 lb.; Denver 79c.; minimum carload 36,000 lb.; Omaha 47c.; minimum carload 36,000 lb.; New Orleans 30.7c.; Birmingham 46c.; Pacific Coast 75c.; minimum carload 80,000 lb. To the Pacific Coast, the rate on steel bars and structural steel is 90c.; minimum carload 40,000 lb. and 85c.; minimum carload 50,000 lb. On wrought iron and steel pipe, the rate from Pittsburgh to Kansas City is 40c. per 100 lb., minimum carload 46,000 lb.; to Omaha 40c., minimum carload 46,000 lb.; to St. Paul 35.5c., minimum carload 46,000 lb.; Denver 79c., minimum carload 46,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in., angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3c.

Wire Products

(Prices of independent mills.)

Wire nails, $4 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire, $4.05 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.95; galvanized wire, $4.65; galvanized barb wire, and fence staples, $4.85; painted barb wire, $4.15; polished fence staples, $4.15; cement-coated nails, $3.90 base these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 43 per cent off list for carload lots, 42 per cent off for 1000-rod lots, and 41 per cent off for small lots, f.o.b. Pittsburgh.

Nuts and Bolts

Discounts in effect for large buyers are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days.

Carriage bolts, small, rolled thread, 40 per cent; small cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent with c. p. nuts 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq. blank, $1.70 off list, and tapped, $1.50 off; hex. blank, $1.50 off, and tapped, $1.30 off; nuts, c. p. c. and t. sq. blank, $1.25 off; and tapped, $1 off; hex. blank, $1.25 off, and tapped, $1 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Wire Rods

Soft Bessemer and open-hearth rods to domestic consumers at $57; high-carbon rods made from ordinary open-hearth steel, $95 to $100, and special steel rods with carbons running from 0.40 to 0.60, $100 to $1.10 at mill; above 0.60 carbon, $115 to $120.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. and larger, $5 to $5.50; ¾ in., 7/16 in. and ½ in., $7.00 base. Boat spikes are occasionally quoted $7 to $8, all per 100 lb., f.o.b. Pittsburgh, but some makers are quoting higher. Track bolts with square nuts, 7c. to 7.50c. to railroads, and 8c. to 8.50c. in small lots for fairly prompt shipment.

Steel Rails

Angle bars at 3.50c. to 3.75c. at mill, when sold in connection with orders for standard section rails and on carload and smaller lots, 4c. to 4.25c. at mill. Light rails 25 to 45 lb., $75 to $80; 16 to 20 lb., $80 to $81; 12 and 14 lb., $82 to $83; 8 and 10 lb., $83 to $84; in carload lots, f.o.b. mill, with usual extras for less than carloads. Standard Bessemer rails, $38; open hearth, $40 per gross ton, Pittsburgh.

Tin Plate

Effective July 31, prices on all sizes of terne plates were advanced from $2 to $2.50 per package and are now as follows: 8-lb. coating, 200 lb., $16 per package; 8-lb. coating, I. C., $16.30; 12-lb. coating, I. C., $17.50; 15-lb. coating, I. C., $18.25; 20-lb. coating, I. C., $19; 25-lb. coating, I. C., $20; 20-lb. coating, I. C., $21; 35-lb. coating, I. C., $22; 40-lb. coating, I. C., $23 per package, all f.o.b. Pittsburgh, freight added to point of delivery

Iron and Steel Bars

Steel bars at 2.90c. for delivery late this year, and 4.50c. to 5c. from warehouse, in small lots for prompt shipment. Refined iron bars, 4.75c., railroad test bars, 5.25c. in carload and larger lots f.o.b. mill.

Wrought Pipe

The following discounts on steel are to jobbers for carload lots on the Pittsburgh basing card in effect from May 1, 1917, all full weight, except for LaBelle Iron Works and Wheeling Steel & Iron Co., which quote higher prices, and National Tube Co., which adheres to card of April 1.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	23	+4
½	46	31½	⅜	24	+3
¾ to 3	49	35½	½	28	10
			¾ to 1½	33	17

Lap Weld

2	42	29½	2	26	12
2½ to 6	45	32½	2½ to 6	8	15
7 to 12	42	28½	7 to 12	25	12
13 and 14	32½	..			
15	30	..			

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	38	20½	⅛, ¼ and ⅜	22	5
½	43	30½	½	27	14
¾ to 1½	47	34½	¾ to 1½	33	18
2 to 3	48	35½			

Lap Weld, extra strong, plain ends

2	40	28½	2	27	14
2½ to 4	43	31½	2½ to 4	29	17
4 to 6	42	30½	4½ to 6	28	16
7 to 8	38	24½	7 to 8	20	8
9 to 12	33	19½	9 to 12	15	3

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are four (4) points lower basing (higher price) than the above discounts on black and 5½ points on galvanized.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are nine (9) points lower (higher price).

Boiler Tubes

Nominal discounts on less than carload lots, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes and from April 2, 1917, on lap-welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths. Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets

Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net or 2 per cent discount in 10 days:

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

	Cents per lb.
Nos. 3 to 8	8.00 to 8.50
Nos. 9 and 10	8.25 to 8.50
Nos. 11 and 12	8.50 to 8.75
Nos. 13 and 14	8.75 to 9.00
Nos. 15 and 16	9.00 to 9.25

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	8.30 to 8.80
Nos. 22 and 24	8.35 to 8.85
Nos. 25 and 26	8.40 to 8.90
No. 27	8.45 to 9.00
No. 28	8.50 to 8.95
No. 29	8.55 to 9.05
No. 30	8.65 to 9.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	8.50 to 9.00
Nos. 12 and 14	8.60 to 9.10
Nos. 15 and 16	8.75 to 9.25
Nos. 17 to 21	8.90 to 9.40
Nos. 22 and 24	9.05 to 9.55
Nos. 25 and 26	9.20 to 9.70
No. 27	9.35 to 9.85
No. 28	9.50 to 10.00
No. 29	9.75 to 10.25
No. 30	10.00 to 10.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	7.80 to 8.30
Nos. 17 to 21	7.85 to 8.35
Nos. 22 and 24	7.90 to 8.40
Nos. 25 and 27	7.95 to 8.45
No. 28	8.00 to 8.50
No. 29	8.05 to 8.55
No. 30	8.05 to 8.55
Nos. 30½ and 31	8.10 to 8.60

Pittsburgh and Nearby Districts

An interesting suit expected to come up at Charleston, W. Va., in November or December, is that of George W. Shera against the Carbon Steel Co. of Pittsburgh. The case involves an alleged misapplication of funds as special bonuses to certain officers of the company instead of dividing the profits among the stockholders. It is said that Shera's wife owns stock in the company, and for that reason he is the plaintiff. The Carbon Steel Co., it is alleged, during the war has been engaged in manufacturing munitions and has realized handsome profits. However, the plaintiff charges that instead of voting these profits as dividends, large bonuses were voted to certain officials of the company for alleged promoting of sales. Judge Keller has appointed Fred O. Blue, former tax commissioner, to take testimony in the case and act as special master. Charles McKnight, president of the Carbon Steel Co., has issued a statement declaring that the suit is an attempt on the part of certain stockholders to gain control of the company at its annual meeting to be held in Pittsburgh on Nov. 1.

Stockholders of the Westinghouse Air Brake Co. met at Wilmerding, Pa., last week, where its main offices are located, and elected directors as follows: H. H. Westinghouse, chairman of the board; John F. Miller, president; A. L. Humphrey, vice-president and general manager; R. F. Emery, secretary and treasurer; S. C. McConahey, acting vice-president; Charles A. Rowan, comptroller, and John Eicher, auditor. The following officers were re-elected: Cyrus S. Gray, E. M. Herr, A. L. Humphrey, Charles McKnight, John F. Miller, Morris S. Rosenwald, John R. McGinley, W. D. Uptegraff and H. H. Westinghouse. Following the meeting the stockholders visited the new plant of the Union Switch & Signal Co., now being built at Swissvale, Pa.

Stockholders of the Stungo Radium Rubber Co., Washington, Pa., held a meeting last week and have reorganized the company, which got into financial trouble some time ago. It is now known as the Washington Rubber Co.

The Schaefer Equipment Co., Oliver Building, Pittsburgh, dealer in railway materials, has been appointed selling agent in the Pittsburgh district for a gun for removing open hearth slag, made by the Rivet Cutting Gun Co., 220 East Second Street, Cincinnati, an illustrated description of which appeared on page 807 of THE IRON AGE of Oct. 4.

The Columbia Steel & Shafting Co. is building a modern laboratory adjoining its general offices at Carnegie, Pa.

The Pittsburgh Iron & Steel Foundries Co., Midland, Pa., is reported in the market for one 10,000-lb. steam hammer and several heavy lathes.

The West Virginia Water & Electric Co., Charleston, W. Va., will build an addition to its boiler house, 46 x 75 ft., and will need some new equipment.

The National Carbide Co. will build a new chemical plant at Bramwell, W. Va., reported to cost $500,000. The general contract has been placed with Westinghouse, Church, Kerr & Co., New York.

Liberty Mill Started

WASHINGTON, Oct. 23.—Chairman Hurley of the Shipping Board has received a telegram from Pittsburgh signed by President J. A. Farrell announcing the completion of a new mill to manufacture steel ship-plates exclusively. The telegram was dated Oct. 18 and read as follows:

"The Carnegie Steel Co. put into successful operation to-day its new 110-in. plate mill with a capacity of 150,000 tons per annum of ship-plates. This mill was built in exactly six months and is known as the Liberty Mill."

Imports of machine tools into Italy in 1916 are reported to have been 22,488 metric tons as compared with 6690 tons in 1915 and 8988 tons in 1914.

Lake Ore to St. Louis by Water

Coincident with the arrival at St. Louis of the first barge tow of iron ore from Minnesota for the Mississippi Valley Iron Co.'s blast furnace, Secretary of Commerce Redfield, at a dinner given by the Chamber of Commerce Saturday, Oct. 20, in honor of the event, announced that the Government was prepared to support to the limit the opportunity for the development of waterways traffic, both by the construction of steel barges under the direction of the United States Shipping Board and by the utilization of money from the $100,000,000 defense fund at the disposal of President Wilson, if the Shipping Board was unable to supply all needed funds. He also stated that the Shipping Board had set aside $3,500,000 for the construction and equipment of four fleets of barges and tow boats, 24 of the latter and four of the former, and that any part or all of the contracts for this construction could be had by St. Louis concerns able to undertake the work with assurance of rapid completion.

The arrival of the first tow of ore from the North was made an official event. The tow was met some miles up the river by Secretary Redfield, escorted by the Mayor of St. Louis and other prominent officials and citizens of the city. The six barges with about 4000 tons of iron ore were then escorted to their destination with flags flying and whistles blowing on both sides of the river as well as on the harbor water craft. Following the ceremonies on the river, a dinner was given in the evening at the Planters' Hotel which was attended by the city's most prominent business men. It was there that Secretary Redfield made his announcement.

At the dinner Edward F. Goltra, president of the company, made the announcement that the experimental trips with coal up the river and ore down the river had been made at a saving over the rail rate of more than a dollar per ton and predicted that with regular service and equipment established the saving would be doubled or more. The barges to be built by the Government will be 310 ft. long, 50 ft. beam, with a capacity of 2000 tons each and a draft loaded of less than 4 ft. The trip of the tow from St. Paul was made in five days, despite the difficulties of unusually low water.

Incidental to the meeting, Charles W. LaPorte, Peoria, Ill., made the announcement that his company, in an experiment with water transportation, had brought pig iron from Birmingham, Ala., in barges in seven days as against fourteen by rail with its uncertainties of movement of cars when loaded.

A saving in the use of about 56 cars per day in the transportation of less-than-carload freight from the city of Baltimore, says the Pennsylvania Railroad, is being achieved as the result of the "shipping day" or "sailing date" plan for handling this traffic which was inaugurated Oct. 1. This is the beneficial result of co-operation between the public and the railroad in the effort to make the most efficient possible use of transportation facilities. The purpose of the "shipping day" plan is to concentrate less-than-carload freight, as far as practicable, into full carloads at the point of origin. It has been estimated that when the new system is in full operation it will save, on the Pennsylvania Railroad east of Pittsburgh and Erie, alone, the use of upward of 1000 cars per day in the transportation of less-than-carload freight. The plan was first made effective in Philadelphia, where it went into operation one month earlier than at Baltimore. Within the near future it will be extended to New York, for which the detailed schedules have almost been completed. Ultimately the plan will be effective at all principal freight shipping centers on the lines of that railroad.

The W. G. Knight Machinery Co., St. Louis, Mo., has acquired a site on which it will erect a new and larger plant than it now has for the manufacture of fine machines and tools. A thoroughly modern machine shop will be equipped.

BUYING LIBERTY BONDS

United States Steel Corporation Increases Its Investment—Other Subscribers

The United States Steel Corporation this week increased its investment in the Liberty loan by $33,300,000, making a total of $43,300,000 of the second loan which it has taken. Other manufacturers of iron and steel products have contributed largely in swelling the fund. The campaign closes Saturday, Oct. 27, and a large volume of subscriptions is expected this week from the iron and steel trade. Among those whose subscriptions have been received since last week's issue are the following:

H. W. Johns-Manville Co.	$850,000
Railway Steel Spring Co.	500,000
Gaston, Williams & Wigmore	500,000
Marlin-Rockwell Corporation	1,500,000
Underwood Typewriter Co.	250,000
Rogers, Brown & Co.	250,000
National Enameling & Stamping Co.	100,000
William A. Rogers, Buffalo	100,000
Atlas Crucible Steel Co.	100,000
Electric Storage Battery Co.	250,000
New York Air Brake Co.	500,000
The American Radiator Co.	100,000
Charles A. Schieren Co.	100,000
American Smelting & Refining Co. (additional)	$3,500,000
Charles M. Schwab	1,000,000
United States Cast Iron Pipe & Foundry Co.	250,000
Joseph Dixon Crucible Co.	$500,000
Joseph Dixon Crucible Co. of New Jersey	500,000
Remington Typewriter Co.	285,500
United Shoe Machinery Co.	1,000,000

Machinery Men Active

The special Liberty loan committee of the New York machinery and machine-tool trade, of which J. W. Lane, president E. W. Bliss Co., Brooklyn, is chairman, had raised about $7,000,000 up to Monday, Oct. 22. The goal was fixed at $20,000,000 and members of the committee are working constantly to bring the total of subscriptions up to that amount. Among the largest subscribers are the following: E. W. Bliss Co., $500,000; Railway Steel Spring Co., $500,000; Niles-Bement-Pond Co., $500,000; the Babcock & Wilcox Co., $450,000; the Worthington Pump & Machinery Corporation, $300,000; Henry W. Prentiss & Co., $100,000; Manning, Maxwell & Moore, Inc., $100,000; American Machine & Foundry Co., $50,000; Fairbanks, Morse & Co., $50,000.

Cleveland Subscribers

Late subscriptions for Liberty Loan bonds in Cleveland include $1,500,000 by the Valley Mould & Iron Corporation, Sharpsville, Pa.; $1,000,000 by the Otis Steel Co., $150,000 by the Pittsburgh Steamship Co., $100,000 by the Cleveland Crane & Engineering Co., and $100,000 by the Chandler Motor Car Co. The Cleveland Cliffs Iron Co., which recently made a $500,000 subscription, has increased this to $1,000,000.

Youngstown Subscribers

YOUNGSTOWN, OHIO, Oct. 22.—It was estimated here to-day that the corporations and people of Youngstown had taken Liberty Bonds in the sum of $4,500,000. One subscription received at the banks Saturday night was $275,000 as a part of the bonds sold in the campaign that is going on at the works of the Youngstown Sheet & Tube Co. Monday the Brier Hill Steel Co. introduced a bond buying campaign in which all employees will have an opportunity to purchase these securities under a 10 months payment plan. It is expected that more than 90 per cent of the men will go in under the plan, great encouragement being given by interested officials during the first two days of the drive.

The Ohio Iron & Steel Co. through Robert Bentley, its president, has taken securities to the amount of $500,000. Of this amount $300,000 is in Liberty bonds and $200,000 in four per cent Government certificates.

The Brier Hill Steel Co., Youngstown, Ohio, which subscribed for $2,000,000 of Liberty bonds has inaugurated a plan among its employees of allowing them to subscribe for Liberty bonds on a monthly payment plan, the company to carry the loans until the bonds are paid for.

Officials of the Youngstown Sheet & Tube Co. are highly pleased with the results of the efforts of the company so far to sell Liberty bonds to its employees. Committees were organized in every department of its numerous plants to solicit subscriptions among employees, and fully 95 per cent or more have subscribed. The campaign started on Thursday, Oct. 18, and will last for one week.

Strike of Building Trades at Arsenal

When 900 men employed by three contractors engaged in important extensions at the Watertown Arsenal, Watertown, Mass., went on strike, Oct. 22, and the leaders stated that 2000 more men would not return to work the next morning, it appeared as though the structural trades had thrown down the gauntlet to the United States Government, as the contractors were carrying on their work strictly in obedience to the conditions agreed upon by President Wilson and Samuel Gompers, president of the American Federation of Labor. The urgency of the work is such that any delay in completion of the buildings would have been of vital moment to our fighting forces. The patriotism and good sense of the men, however, prevailed, and most of them repudiated the action of the labor leaders by returning to work the next day, only about 250 men remaining out.

The contractors concerned were the Stone & Webster Corporation, the New England Structural Steel Co. and the Norcross Brothers Co. The latter company employs union labor and the men had no grievance against their employer, only a few men going out in sympathy with the other strikers. A demand was made that the New England Structural Steel Co. employ only union men and that the Stone & Webster Corporation pay double time for overtime instead of time and one-half as was being paid under the Government agreement. Secretary of War Baker was expected to visit the plant Oct. 24 and it is reported that one labor leader stated that the strike was called at this time in order to make a show of force that would compel the War Department to ac-

$100,000,000 for Ordnance Depot in France

WASHINGTON, Oct. 22.—The Ordnance Division of the War Department has authorized announcement of the letting of a contract for the $100,000,000 ordnance depot and arsenal to be erected by the United States at its base in France. All of the labor and special machinery for the erection of the plant are to be transported to France from this country. The Stone & Webster Engineering Corporation, Boston, received the contract, and has been busy for some weeks in purchasing the machine-tool equipment, structural steel and other necessary material for the buildings. Payment for the work will be on a cost-plus 10 per cent arrangement. The equipment alone for the shops it is estimated will cost $6,000,000.

The St. Louis Malleable Casting Co., St. Louis, Mo., has purchased an additional three and one-half acres, on which it will erect a gray-iron foundry, a steel foundry of about 60 tons' daily capacity and a forging and a brass shop. About half of the additional capacity will be used by the company for its own line of products and the remainder for job work for its customers.

The Colonial Steel Co., Pittsburgh, has subscribed $500,000 for Liberty Bonds, Standard Underground Cable Co. $500,000 and Dilworth, Porter & Co., Ltd., spike manufacturers, $700,000. Employees in the mills of the American Steel & Wire Co. in the Pittsburgh district subscribed for $635,000.

For the meeting of the National Machine Tool Builders' Association to be held at the Hotel Astor, New York, Oct. 30 and 31, no program has yet been announced.

PERSONAL

Robert S. Alter, vice president and foreign manager, American Tool Works Co., Cincinnati, at a recent meeting of the Foreign Trade Association of the Cincinnati Chamber of Commerce, was unanimously re-elected president of that association. For some time past Mr. Alter has been very much interested in extending American trade through Spanish-America. He is also in communication with Mexican Government officials endeavoring to establish a through freight package car service between Cincinnati and Mexico City, which idea has now the approval of both the railroad and Mexican Government officials. At a recent meeting of the National Foreign Trade Association, of which James A. Farrell is president, Mr. Alter extended an invitation for this association to hold its next annual convention in Cincinnati, and it is understood that this invitation has received favorable attention by the officers of that association.

R. S. ALTER

John T. Heffernan, president and treasurer of the Heffernan Engine Works, Seattle, has been called to Washington to work on the Government's extensive program for construction of merchant vessels. Mr. Heffernan is associated with the American International Corporation, which has been asked by the Government to undertake the construction of 200 steel cargo steamers, each with capacity of 7500 tons dead weight, and make delivery of the vessels within 24 months. During the next two years his time will be spent between Washington and Philadelphia.

D. J. Murphy, formerly in the New York sales office of the American Steel & Wire Co., has resigned to become manager of sales of the West Leechburg Steel Co., of Pittsburgh, in charge of New York and New England territory, and will have his offices at 50 Church Street, New York.

Murray Shipley, formerly of the Lodge & Shipley Machine Tool Co., Cincinnati, is now affiliated in an official capacity with Sechler & Co., Cincinnati, builders of carriages and of automobile and auto-truck trailers.

Henry M. Wood, who was formerly with the Lodge & Shipley Machine Tool Co., Cincinnati, is now connected with the sales department of Sechler & Co., Cincinnati.

J. C. M. Des Islets has become sales engineer of the Duquesne Steel Foundry Co., Pittsburgh. He was formerly connected with the Pressed Steel Car Co., in the sales, engineering and cost departments, and later as designing engineer for the Defiance Machine Co., Defiance, Ohio.

Frank R. Bacon, president Cutler-Hammer Mfg. Co., Milwaukee, who was appointed captain in the industrial reserve early this year, has been detailed to active service as general supervisor of the execution of Government contracts for the manufacture of machine guns at New Haven, Conn. The position carries with it promotion to the rank of major. Because the new duties require his entire time, Major Bacon temporarily has relinquished active connection with the Cutler-Hammer company.

William L. Thorkelson, general superintendent Belle City Mfg. Co., Racine, Wis., resigned Oct. 15 to engage in business on his own account. The employees presented him a watch, chain and charm at a farewell banquet.

Lee T. Pond, who has been associated with the office of the attorney general of Wisconsin for many years, has resigned to accept the position of assistant secretary of the United States Switch Co., Eau Claire, Wis., a corporation organized recently to manufacture automatic switch and switch lock appliances for railroads.

Norman B. Livermore, president N. B. Livermore & Co., San Francisco, has been commissioned a captain in the United States Engineer Corps, and has received orders for immediate foreign service.

The Western Engineering and Technical Headquarters has been opened in the Sheldon Building, San Francisco, with George C. Ryno and U. R. Grant as managers. The organization is planned on the same lines as the Chemical Club of New York, providing comfortable quarters for visiting technical men and assistance in obtaining employment, if desired.

J. A. McGregor, president Union Iron Works, San Francisco, has left for the East to complete arrangements with the Government for the construction of war vessels to be built at the works during the next two years.

John McConnell, Canton, Ohio, who resigned last spring as general superintendent of the United Alloy Steel Corporation, Canton, has opened an office in Canton as a consulting metallurgical engineer, to pay particular attention to problems pertaining to alloy steels. The United Alloy Steel Corporation is one of his principal clients.

Harry A. Butz, chief engineer Donner Steel Co., has been engaged as resident engineer in charge of the construction of the iron and steel works which the Compania Siderurgica Del Mediterraneo will build at Sagunto, Spain, and for which Frank C. Roberts & Co., Philadelphia, are the engineers.

William O. Renkin, recently chief engineer for A. M. Byers & Co., Pittsburgh, where he had charge of experimental work and the installation of a powdered coal plant on puddling and reheating furnaces, is now connected with the Quigley Furnace Specialties Co., Inc., New York, which is devoted particularly to powdered coal installations. He is manager of the engineering department of the company. He was resident engineer at the time of the organization and construction of the works and town at Sakchi, Bengal, India, for the Tata Iron & Steel Co.

Everett Morss, president Simplex Wire & Cable Co., Boston, has been appointed member of the Priority Committee of the Council of National Defense by Judge R. S. Lovett.

Guy L. Bayley, who was chief mechanical and electrical engineer for the Panama-Pacific Exposition, where he also served on an International Jury of Awards, is now assistant to the president of the Federal Export Corporation. He has had a long experience in the Far East as consulting and erecting engineer for railroad, mining and industrial projects.

W. H. Bramman has been appointed assistant to the president of the Walter A. Zelnicker Supply Co., St. Louis. He was formerly associated with the American Carbon & Battery Co.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, resumed operations last week on one of its two suspended 51-oven units at its Koppers by-product plant. This was made possible by an increased coal supply. The company now has 153 of its 204 ovens in operation, and as a result, likely will be able to continue operation of its blast furnaces. Otherwise the coal situation from the industrial viewpoint is much as it has been at Youngstown for some days. Plants are just able to operate. Some weeks ago plant operators thought they were skating on thin ice when they had but a few days' fuel supply ahead, but now many plants often do not have more than 24 hours' supply of coal ahead.

The Atikokan Iron Co., Port Arthur, Canada, whose blast furnace has been long idle, is being prodded by the City Council, which will ask to have the plant operated under the supervision of the Canadian Government. The Council is also taking steps to inquire into the company's finances and mineral resources.

OBITUARY

DR. EUGENE F. ROEBER, editor *Metallurgical and Chemical Engineering*, died at his home in East Orange, N. J., Oct. 17, after a long illness. He was born in Torgau, Germany, Oct. 7, 1867, and was graduated from the universities at Jena, Halle and Berlin. The degree of doctor of philosophy was bestowed on him by the University of Berlin. His first work in the United States was in association with Dr. Carl Hering of Philadelphia, in electrical engineering, soon after

DR. E. F. ROEBER

his arrival in this country in 1894. He was one of the originators of the American Electrochemical Society in 1902 and was its president in 1913-1914. He was also a member of the American Institute of Mining Engineers, the American Institute of Electrical Engineers and the American Chemical Society. His chief work had been in the editorial line, having become editor of the *Electrochemical Industry*, now *Metallurgical and Chemical Engineering*, when it was started in 1902. The growth of this paper under his direction in influence and as a power in the electrochemical industry of the country has been striking. He will be remembered by many friends and associates, not only for this achievement, but for his unique and forceful editorials as well as his genial personality and helpful counsel. Work was his keenest source of enjoyment and in this his example will be enduring.

FRANK H. ZIMMERS, secretary of the Pittsburgh Foundrymen's Association since its inception more than 20 years ago, and well known in the foundry trade all over the country, died at the Presbyterian Hospital, N. S., Pittsburgh, on Tuesday morning, Oct. 23, after an illness of several weeks. Mr. Zimmers took keen interest in the affairs of the Pittsburgh Foundrymen's Association, seldom having missed a meeting for more than 20 years, and also attended regularly the annual meetings of the American Foundrymen's Association, in whose councils he will be sadly missed. He was born in Blairville, Pa., and when 16 years of age joined the engineering corps of the Baltimore & Ohio Railroad, later going with the Pennsylvania Railroad in the same capacity. He was identified with the latter railroad during the famous railroad riots in Pittsburgh in 1877. He then went back to Blairsville, where he operated a shoe business for some years, and then returned to Pittsburgh, where for years he was connected with the Union Foundry & Machine Co., whose plant was on West Carson Street, Pittsburgh, continuing with that concern until its plant was destroyed by fire about three years ago, when the company retired from the foundry business. Later he represented, in Pittsburgh, the United States Steel Foundry Co., of New Cumberland, W. Va., manufacturer of steel castings, but in the early part of this year retired from this position, and organized the firm of Zimmers & Co., with offices in the Hartje Building, acting as brokers in iron and steel and manufacturers' agents. Mr. Zimmers was very prominent in Masonic circles, having held in the past few years high positions in that fraternity.

EDWARD D. FLOYD, senior member of the firm of Chandler & Floyd, New York, iron and steel merchants, died on Wednesday, Oct. 17, at his home, Westfield, N. J., following a stroke of apoplexy. He was a director of the Allegheny Steel Co., Pittsburgh, and had been active in the affairs of Chandler & Floyd for the past 20 years. He was 51 years old. His clubs included the Pittsburgh Athletic Club, the Westfield and Baltusrol golf clubs and the Engineers' Club and Elks' Club of New York.

FRANK L. STEWART, secretary and general manager of the Cincinnati Iron Fence Co., Cincinnati, died at his residence in that city Oct. 18, following an operation at a local hospital. He was 51 years old and was connected for more than 12 years with the firm, of which he was general manager at the time of his death.

JOSHUA WOLFE ZEEVE, president of the Chicago Machinery & Equipment Co. of Seattle, Wash., died at his home in that city recently. Mr. Zeeve was born in Russia in 1858, coming to this country when 12 years of age. He has been in business in Seattle for 16 years.

SOLVING FUEL PROBLEMS

Dr. Garfield Endeavoring to Regulate Supply of Steam Coal

WASHINGTON, Oct. 23.—Dr. Harry A. Garfield, Fuel Administrator, is in the midst of the very difficult task of regulating the supply of steam coal in the United States. Large consumers of this coal have been making inquiries quietly of the Fuel Administration as to where they are to obtain contracts for their winter supply. It is said many coal operators are refusing to sell at the price fixed by the President. They hesitate about accepting a higher price from consumers for fear of being punished under the law. The question of prices, however, is but one of the many perplexing phases of the situation.

Coal operators of the Fairmount, W. Va., field have asked that the price fixed for coal in their district be raised to meet a wage increase demanded by miners. The miners are asking increases similar to those which recently were granted in the central competitive field contingent on a raise in coal prices. The operators presented estimates to show that from 28 to 39 cents will be added to the cost of producing coal if the wage increases are given. Labor difficulties have also been experienced in Illinois, Indiana and Ohio. Dr. Garfield was compelled to give his sole attention to this latter strike threat during the week.

The labor situation is being handled incident to the development of a general scheme for distributing coal. The Fuel Administrator has about completed his regulations for limiting coal exports to Canada. Control of such shipments will be exercised through the issuance of special permits to shippers, who will be allowed to forward cargoes up to the amounts prescribed by the Fuel Administration without obtaining special export licenses. The plan is to hold Canada through the remainder of the year to supplies not exceeding 10 per cent more coal than was received last year. This arrangement is based on a 10 per cent increase in production in the United States this year and permits the Dominion to share equally with us. Permits for shipments will be granted only to shippers who sent coal to Canada last year.

Measures have been taken by the Shipping Board to relieve the coal shortage in New England and thereby facilitate the extensive manufacturing industries of that section of the country. The New England coal supply is dependent chiefly upon water transportation through Long Island Sound and up the coast. Under the direction of the Shipping Board, there was organized the New England Coal Barge and Towing Association.

TABLE OF FIXED PRICES

Explanation, Giving More Additional Details, Issued at Washington

WASHINGTON, Oct. 23.—James B. Bonner, acting on behalf of the subcommittee on steel distribution of the American Iron and Steel Institute, has issued a table of fixed prices in explanation of the basic prices already promulgated from the White House. The explanatory table of prices gives in detail those differentials and further explanations which were not given in the officially announced list. For instance, it was explained the fixed price of $51 per gross ton on billets is the price for billets under 4 by 4 in. for rerolling but not for forging. The official prices announced heretofore merely gave the base.

The subcommittee on steel distribution is to act independently of the Council of National Defense, but in co-operation with it, after the fashion of the War Board of the American Railway Association. This subcommittee occupies the local offices of the American Iron and Steel Institute and is composed of the following: J. A. Farrell, chairman; J. B. Bonner, vice-chairman; E. A. S. Clarke, J. A. Topping and F. J. Hall.

The table of prices in explanation of the Government fixed prices issued by this committee follows:

COMMODITY	BASE PRICE F.O.B.	REMARKS
Pig Iron	$33.00 gross ton furnace	Full differentials extra list, pig iron
Blooms and Billets 4 in. x 4 in. and larger (for rerolling but not for forging)	$47.50 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Billets under 4 in. x 4 in. (for rerolling but not for forging)	$51.00 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Slabs ..... Comprising sections width of which is at least twice the thickness, not under 16 sq. in. sectional area.	$50.00 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Sheet Bars.....	$51.00 gross ton, Pittsburgh, Pa., or Youngstown, O.	Full differentials extra list, semi-finished material
Skelp, Grooved ...	2.90c lb. Pittsburgh	Prices net, no extras apply
Skelp, Universal...	3.15c lb. Pittsburgh	Price net, no extra applies
Skelp, Sheared ...	3.25c lb. Pittsburgh	Plus standard classification of extras on steel bars and small shapes
Wire Rods.....	$57.00 gross ton, Pittsburgh. Pa.	Plus standard classification of extras on steel bars and small shapes
Steel Bars (not including Shell Steel)	2.90c lb. Pittsburgh or Chicago	Plus standard classification of extras on standard structural shapes
Small Shapes (under 3 in.)...	2.90c lb. Pittsburgh or Chicago	Plus standard classification of extras on steel plates
Standard Structural Shapes (3 in. and over)	3.00c lb., Pittsburgh or Chicago	Rounds, round cornered squares or Gothic section
Plates (3/16 in. thick and heavier)	3.25c lb., Pittsburgh or Chicago	Diameter of round and diagonal of Gothic section or round cornered square are the governing dimensions
Shell Steel:		Material to be furnished in multiples of customer's unit, down to and including the single unit.
3 in. to 5 in. inclusive	3.25c lb. *Net*, Pittsburgh	Specifications to be practicable and satisfactory to the steel manufacturer so long as the specifications secure material suitable for the purpose intended.
Over 5 in. to 8 in. inclusive	3.50c lb. *Net*, Pittsburgh	
Over 8 in. to 10 in. inclusive...	3.75c lb. *Net*, Pittsburgh	
Over 10 in.	4.00c lb. *Net*, Pittsburgh	

The customary practice with respect to adding the freight rate in effect at time of shipment, from the basing point to destination, is also to be effective in arriving at delivered prices.

INCREASED EFFICIENCY

Good Showing of Railroads with Slight Increase in Equipment

WASHINGTON, Oct. 23.—Reports received by the Railroads' War Board show that on Oct. 1 the excess of unfilled orders from shippers for freight cars over and above the idle cars at different points numbered 70,380. This is the figure, it was said, which has been commonly, but inaccurately, referred to as car shortage. This compares with the excess of unfilled car requisitions amounting to 77,682 on July 1; 33,776 Aug. 1, and 34,605 on Sept. 1.

The actual number of unfilled car orders on October 1 was almost identical with the number on Oct. 1 last year, the figures being 94,572 for Oct. 1, 1917, and 94,854 for Sept. 30, 1916. The difference in the excess of unfilled orders over idle cars for the two years is accounted for by the fact that on Sept. 30, 1916, as many as 34,157 cars were idle, whereas on Oct. 1, 1917, only 24,192 were reported as idle, thus indicating a more efficient use of the available equipment on the part of the railroads.

Returns to the Railroads' War Board show that the actual number of cars and locomotives now in service on American railroads is only slightly in excess of the number at this time last year. The War Board on Oct. 10 had been in existence exactly six months and the returns just at hand show that during that period the railroads of the country have rendered upward of 15 per cent more service than they did during the same period last year with practically the same plant.

The outstanding feature of the present situation is the degree to which the railroads are co-operating wholeheartedly with one another and with the Railroads' War Board in the effort to produce a maximum of transportation efficiency. As the demands upon the railroads incident to the war are apt to increase, the need for the utmost co-operation on the part of all concerned will become increasingly greater, it was pointed out.

Merryweather in Charge of Machine Tool Matters

WASHINGTON, October 23.—G. E. Merryweather of Cleveland has taken charge of the machine tool question for the Government. R. S. Brookings, of the War Industries Board, has charge of finished products and under him recently was created the machine tool section, which has been placed in charge of Mr. Merryweather. Explaining his duties to the representative of THE IRON AGE, Mr. Merryweather stated that his work falls into three parts:

1. In the first place, he has made a survey of the output of machine tools in American factories. This survey is now practically complete and the Government has the advantage of knowing approximately the capacity of our own industries.

2. Mr. Merryweather has also listed all available equipment. This includes tools in transit or tools in stock and tools held at the ports for shipment abroad. The latter is a most important item inasmuch as it is discovered that many of the shipments intended for foreign account may be utilized by the United States. Some of these shipments were to go to neutral countries, but cargo space is not available and it is possible that other shipments may be embargoed by the War Industries Board. Mr. Merryweather has a complete list of this supply of tools.

3. The other duty of Mr. Merryweather is to make up a complete list of the requirements of the War and Navy Departments. This is now being done. The list when completed will be used as a guide to American tool builders in organizing their shop program from now on. Some of the designs are now coming from abroad, notably France. It is discovered that in some lines the American plants are more than supplied with a sufficient number of tools whereas the production of other lines of tools must be greatly increased to meet the war needs.

Machinery Markets and News of the Works

PRIORITY ORDERS TANGLED

War Industries Board at Work on Solution

G. E. Merryweather Appointed to Take Charge of Machine-Tool Section and Summons Builders to Assist Him

The appointment of G. E. Merryweather, president Motch & Merryweather Machinery Co., Cleveland, in charge of the Machine Tool Section of the War Industries Board, is expected to result in a straightening out of the tangles which have resulted from the many and conflicting priority orders of Government departments for deliveries of machinery and machine tools to companies engaged on Government work. Mr. Merryweather, soon after assuming his new duties, summoned about 15 of the foremost machine-tool engineers of the country to the headquarters of the War Industries Board, Munsey Building, Washington, to consult with him regarding ways and means of improving methods of delivery on priority orders and various related matters, the correct solution of which will make the Government's program of providing war equipment more effective.

The Government is also giving attention to the prices which are being charged by the machine-tool builders for their products. In connection with a recent order placed by the Watertown Arsenal for about 20 planing machines, it is understood that formal protest was made by the Government against the price. A recent advance on planers approximated 20 per cent.

Buying in all of the markets continues on a large scale. There is less and less competition for business as sellers feel that they can get all of the orders they can satisfactorily take care of with a minimum of effort. Large orders, which in a normal market would cause considerable excitement, are under present conditions being accepted by builders of machinery under protest because of the already over-crowded condition of their shops.

In the New York market the largest volume of purchasing has been the result of the Navy Department's torpedo boat destroyer program. The Fore River Shipbuilding Corporation has closed for about 50 large machines for its plate and angle shop at Squantum, Mass., and will probably buy tools for its machine shop at Buffalo, N. Y., this week. The boiler shop at Providence, R. I., is also to be provided with equipment. Cranes of various types and capacities, to the number of about 60 to 70, will be bought by the Aberthaw Construction Co., Boston, for the shops. The New York Shipbuilding Corporation, Camden, N. J., which will build 20 destroyers, may issue lists of its requirements this week. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, has inquired for six new tools, but will undoubtedly require more. The Union Iron Works, San Francisco, which has taken over the Risdon Iron Works, will rebuild and equip the latter plant for the building of 16 destroyers. The Union Iron Works has a contract for 40. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va., closed last week for additional equipment.

Yards for the building of merchant ships for the Emergency Fleet Corporation are progressing rapidly, considering the labor situation. The American International Shipbuilding Corporation has purchased between 25 to 30 locomotive cranes from the Industrial Works, Bay City, Mich., for its Hog Island shipyard. The Submarine Boat Corporation and the Lackawanna Bridge Co. have bought five overhead shop cranes for their shipyard near Newark, N. J. Contracts are being made by both of these yards for fabricated steel sections for the ships.

The Federal Shipbuilding Co., New York, an affiliation of the United States Steel Corporation, has taken over from the Dominion Bridge Co., contractor for the new Quebec bridge, a sufficient number of cranes for the 12 shipways which are to be built at the yard on the Hackensack Meadows. The Federal Shipbuilding Co. will, however, require from 12 to 15 new overhead electric shop cranes, for which a list will be issued this week. A list of tools for the new machine shop will also be sent to the trade soon, and later the equipment for the forge shop and other buildings will be bought. The Eastern Shore Shipbuilding Corporation, a new concern, whose president is R. R. Livingston, 2 Rector Street, New York, is equipping its yard at Baltimore, and has just closed for cranes for shipways.

The Savage Arms Corporation appeared as a large buyer last week, closing orders for about $200,000 worth of tools for its Utica, N. Y., plant, where Lewis machine guns are being manufactured. The J. G. White Engineering Corporation has inquired for a few tools. It is reported that this company will engage in making airplane engines for the Government, in which event it will require considerable equipment.

In the Philadelphia machine-tool market, the expansion of plants making ball bearings has attracted attention. The Hess-Bright Mfg. Co. has bought a large number of tools for making bearings for airplane engines. The Wright Roller Bearing Co., which will move its plant from Spring City, Pa., to Philadelphia, and the Carlson & Wenstrom Co., which will build and equip a new factory in Philadelphia, are active buyers. The Simplex Automobile Co. has bought a few grinders, and may soon buy heavily for a Government contract for airplane engines. The H. T. Shearer Machine Co., Waynesboro, Pa., has issued a list of about 20 tools and has also bought some tools for work on a crank shaft contract received from the Ford Motor Co., Detroit. The Frankford Arsenal has placed orders for about $35,000 worth of automatics in Philadelphia. The Pennsylvania Railroad Co. has bought 10 24-in. lathes for shipment to France. The Bartlett & Hayward Co., Baltimore, has closed for a number

of tools and will probably buy more. The Jeanesville works of the Worthington Pump & Machinery Corporation, Hazelton, Pa., is reported to have received its expected shell contract, and may close soon for more equipment.

An Ohio manufacturer has sent an inquiry for about 25 machine tools to the Cleveland market. The Detroit company recently organized by important manufacturing interests of that city to make gun mechanisms for the Government is expected to come into the market very soon for equipment.

The Hart-Parr Co., Charles City, Iowa, is inquiring in the Chicago market for 30 large lathes for 9.2-in. shells. The Rock Island Arsenal and private munitions makers continue to buy. The Root & Van Dervoort Engine Co., East Moline, Ill., has made additional purchases. A central Illinois manufacturer is inquiring for about $100,000 worth of tools for munitions work. A company in northern Michigan wants tools quickly for gun mount building and a similar inquiry emanates from Minneapolis. The Waukesha Motor Co., Waukesha, Wis., will increase its facilities about 50 per cent for work on 2500 army motor trucks. The Allis-Chalmers Mfg. Co., Milwaukee, Wis., is reported about to close a $10,000,000 contract with the Emergency Fleet Corporation for marine turbines.

In New England the Fore River Shipbuilding Corporation, the Watertown Arsenal and the Osgood Bradley Co. are the largest buyers. The Osgood Bradley Co. is reported to have in contemplation considerable additions to its plant at Worcester, Mass., for building gun mounts. The General Electric Co. has bought but little for its West Lynn, Mass., plant, the bulk of the orders on its recent list not yet having been awarded.

Locomotive crane builders were recently called to Washington to assist the Government in its war program, which will require deliveries of more than 300 locomotive cranes in the next few months.

New York

NEW YORK, Oct. 23.

Requirements of the shipbuilding plants to be erected by the Navy Department for constructing 150 torpedoboat destroyers now comprise the greatest buying activity in the New York machinery market. The Fore River Shipbuilding Corporation last week closed for about 50 machines for its plate and angle shop at Squantum, Mass., and will buy tools this week for its machine shop for turbine work at Buffalo. Representatives of crane builders were summoned to Boston on Monday to participate in a division of the crane orders by the Aberthaw Construction Co., which is erecting the manufacturing buildings. A list of 19 cranes of 3 and 5-ton capacity, in addition to the list of about 44 cranes recently issued, came out last week. It is understood that orders for all of these cranes will be awarded this week.

The New York Shipbuilding Corporation, which will build 20 destroyers at its plant at Camden, N. J., has lists prepared, and will issue them this week. Its requirements are not as large as those of the Fore River shipyard. The William Cramp & Sons Ship & Engine Building Co., Philadelphia, issued a list of six tools last week, and it is understood will need other equipment. The Newport News Dry Dock & Shipbuilding Co., Newport News, Va., has closed for a number of machines for its plate and angle shop.

The Federal Shipbuilding Co., 54 Dey Street, New York, will issue a list this week of from 12 to 15 cranes required for its shops at the new plant being erected on the Hackensack Meadows. Cranes for the shipways have been obtained from the Dominion Bridge Co., which has just completed the construction of the Quebec Bridge. In a week or so a list of about 150 tools required for the company's new machine shop will be issued. A list of forge-shop equipment will come out later.

Work is progressing rapidly on the new plant of the Submarine Boat Corporation and the Lackawanna Bridge Co., near Newark, considering the difficulties encountered in obtaining sufficient labor. The buildings now being erected include an administration building, a hotel and restaurant, two fabricating shops, a terminal building, a hospital, two garages, two principal storehouses for the fabricating shops, a storehouse for heavy machinery, a machine shop, an office building, a main substation and meter house, a transformer station, an engine house, and other smaller buildings. The equipment for the shops is being purchased. An order for five cranes has just been placed.

The Savage Arms Corporation last week began the purchasing of about $200,000 worth of machine tools for its Utica, N. Y., factory, where work is being done on Lewis machine guns. A new contract has been closed for guns for airplanes.

The J. G. White Engineering Corporation, 43 Exchange Place, New York, has inquired for a few tools. It is reported that this concern will engage in the manufacture of airplane engines for the Government, and that a large number of machine tools will soon be bought.

Locomotive crane builders met recently in Washington to devise ways of co-operating with the Government in turning out more than 300 locomotive cranes which will be required within the next few months for shipbuilding work, army cantonments, etc. One plant is reported to have been so completely filled with orders that it cannot consider any other work for months, while all of the companies building these cranes will have enough Government work to keep them comfortably busy for the next 60 or 90 days. One locomotive crane builder has speeded up production so that its present output is one crane a day.

Crane business continues active. Some of the smaller plants which have not at any time taken orders for more than a few months ahead are now in a position to quote fairly good deliveries. In the case of the 13 cranes recently taken by the Chesapeake Iron Works, Baltimore, Md., for the Tacony Ordnance Corporation, Tacony, Pa., it is understood that deliveries will be begun in December. A crane builder in the East has been unable to make deliveries of a number of electric overhead cranes because of inability to procure the motors, and hence is now offering deliveries in from three to four weeks of jib cranes up to 3-tons capacity, wall cranes up to 3-tons, and all types of hand-power cranes up to 10-tons capacity and up to 40-ft. span. The Groton Iron Works, New London, Conn., is expected to close this week for three overhead shop cranes. The Eastern Shore Shipbuilding Corporation, 2 Rector Street, New York, has bought several cranes for its new shipbuilding plant near Baltimore. The Watertown Arsenal is taking bids on three cranes. Lindeteves Stovkis, 11 Broadway, is in the market for three hand-power cranes of ½ ton, 30 ft. 6 in. span, and five hand-power cranes of ½ ton, 26 ft. 10 in. span.

The Thorner Mfg. Co., 144 West Eighteenth Street, New York, manufacturer of metal furniture, has leased about 15,000 sq. ft. of floor space at Second Avenue and Twenty-second Street for extensions.

The Sanborn Sectional Weight Co., New York, has been incorporated with a capital of $15,000 to manufacture weights, etc. C. Somberg and B. Berger, 305 East Eighth Street, New York, are the incorporators.

The Erie Specialty Corporation, New York, has been incorporated with a nominal capital of $5,000 to manufacture metal parts for aircraft and kindred specialties. R. E. J. Corcoran, E. Roeder and J. Lorenz, 44 Morningside Drive, are the incorporators.

The Bureau of Yards & Docks, Washington, D. C., is receiving bids for a new six-story, reinforced-concrete power plant, about 58 x 110 ft., at the Brooklyn Navy Yard, to cost about $100,000.

The Old Colony Machinery Co., New York, has been incorporated with a capital of $30,000 to manufacture candy-making machinery. V. M. Turner, C. L. Franklin and H. L. MacMartien, 114 West Fourteenth Street, are the incorporators.

The American Steel Products Corporation, New York, has been incorporated with a capital of $1,000,000, to manufacture iron and steel products. W. S. Brewster, W. P. Kellett and W. B. J. DeLacey, 233 Broadway, are the incorporators.

The Liberty Tractor & Truck Corporation, New York, has been incorporated with a capital of $250,000, to manufacture motor trucks, tractors, etc. G. H. Stelleck, G. Cohen and B. Eversley, 2 West Twenty-ninth Street, are the incorporators.

The Aluminite Mfg. Co., New York, has been incorporated with a capital of $50,000, to manufacture metal specialties. F. J. Pasotti and J. G. Anderson, 272 East 199th Street, are the incorporators.

The Heden Flying Vehicle Co., New York, has been incorporated with a capital of $100,000 to manufacture air-

planes. G. Heden, A. Johnson and H. Leth, 529 East Twenty-ninth Street, are the incorporators.

The Russell Motor Co., New York, has been incorporated in Delaware with capital of $1,000,000 to manufacture motor cars and supplies. George V. Reilly, Samuel B. Howard and Arthur W. Britton, 28 Nassau Street, are the incorporators.

The Galvanizing Corporation of America, Brooklyn, N. Y., has been incorporated with a capital of $36,000 to operate a plant for the manufacture of machinery and treating metals. H. Gerson, W. Statter and I. Seegmiller, 29 Broadway, New York, are the incorporators.

The Asbestos Filter Mfg. Co., New York, has been incorporated with a capital of $10,000 to manufacture filter apparatus. E. S. Moore and W. Hallan, 565 Sixty-eighth Street, Brooklyn, are the incorporators.

The Ithaca Gun Co., Lake Street, Ithaca, N. Y., is building a three-story addition to its plant, about 70 x 100 ft., to cost $40,000. George Livermore is president.

L. E. Fry & Co., Clayton, N. Y., have been incorporated with a capital of $10,000 to manufacture metal equipment and specialties for ships. G. M. Hawn and L. E. Fry, Clayton, are the principal incorporators.

The proposed new plant for the manufacture of tin cans to be erected at Binghamton, N. Y., by the Hires Condensed Milk Co., 913 Arch Street, Philadelphia, will consist of a one-story main building of brick and steel, 150 x 650 ft., with two-story section, 150 x 160 ft.; one-story factory, 120 x 400 ft.; two-story administration building and one-story power plant. John L. Lewis, 36 Wall Street, Binghamton, has the contract, the total cost being about $500,000.

The Seneca Falls Mfg. Co., Seneca Falls, N. Y., manufacturer of leather and wood-working machinery, has been incorporated with an active capital of $575,000. Lathes and other machinery will also be manufactured. L. S. Chapman, H. E. Newell and H. J. Crane are the incorporators.

The Buffalo, Rochester & Pittsburgh Railway Co., Buffalo, is building, at East Salamanca, N. Y., a new machine shop and erecting plant to be used for heavy locomotive repair work. The roundhouse will be increased in capacity and the power house remodeled and enlarged. The company is also building a new engine terminal, 16-stall roundhouse and other buildings at Punxsutawney, Pa.

The Pilot Tire & Rubber Co., Rochester, N. Y., has been incorporated with a capital of $50,000, to manufacture tires and rubber products. F. E. Brown, J. M. Johnson and A. L. Dunton, all of Rochester, are the incorporators.

The Delaney Forge & Iron Co., 300 Perry Street, Buffalo, manufacturers of steel and iron forgings, has been incorporated with capital of $750,000 to provide for expansion. The company is planning to consolidate its works with those of the Canadian Foundries & Forgings, Ltd., Welland, Ont., the latter plant to be used for the production of ship forgings, now manufactured at the Buffalo works. John T. Dillon is president and G. O. Condree, John M. Hull and Charles B. Lascelles, Buffalo, are directors.

The Fore River Shipbuilding Corporation, Quincy, Mass., a subsidiary of the Bethlehem Shipbuilding Co., Bethlehem, Pa., has acquired a site consisting of about 20 acres on Vulcan Street, near the city line, Buffalo, for the erection of a new plant to manufacture turbines. The main building will be about 300 x 700 ft., with a number of smaller shops. It is expected to have the plant ready for operation in about three months, giving employment to over 2000 for initial work. The company proposes to manufacture hulls at its Quincy works and boilers at its Providence, R. I., plant. Joseph W. Powell is president.

The New York Central Railroad, Buffalo, has had plans prepared for the construction of a new power plant on Curtiss Street to cost about $30,000.

The Pullman Co. has filed plans for the erection of a new shop to cost about $6,000 at its car works, Buffalo.

The Cousins & Son Boiler Works, 74 Wabash Street, Buffalo, manufacturer of boilers, stacks, tanks, etc., is considering the erection of a new one-story addition to its plant, about 80 x 120 ft.

The Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, N. J., manufacturer of gear-cutting machinery, will build a four-story addition, about 42 x 50 ft., to cost $18,000.

The Newark Bearing Co., 293 Halsey Street, Newark, has been organized to manufacture ball bearings. Harry Rubin, 161 East 140th Street, New York, heads the company.

The Federal Tool & Machine Co., Newark, has been incorporated with a capital of $10,000 to manufacture machinery and tools. Joseph Ovsiovitch, 24 Scott Street, and Arthur Joseph, Newark, are the incorporators.

The United States Cast Iron Pipe & Foundry Co., Burlington, N. J., manufacturer of cast-iron pipe and fittings, will build a one-story addition to foundry No. 4, 25 x 40 ft., to cost about $10,000. The contract has been awarded.

John R. Proctor, Inc., Bayonne, N. J., has been incorporated with a capital of $30,000 to manufacture metal products and rubber specialties. John R. Proctor and Lewis L. Ransom, 721 Broadway, Bayonne, are the incorporators.

The Lacharnay Carburetor Co., Hackensack, N. J., has been incorporated with a capital of $200,000, to manufacture carburetors. Harvey J. Osborn, Hackensack, and Lemuel Skidmore, Summit, N. J., are the principal incorporators.

The General Appliance Co. of America, Jersey City, has been incorporated with a capital of $50,000 to manufacture telephone apparatus. William Fitzgerald, Jersey City, and Henry Solbel, New York, are the principal incorporators.

The Hercules Storage Battery Co., West New York, N. J., has been incorporated with a capital of $20,000. A. J. Ellis and Robert G. Wiencke, North Bergen, are the principal incorporators.

The Kramer Mfg. Co., Carlstadt, N. J., has been incorporated with a capital of $100,000 to manufacture hooks and eyes, and other metal specialties. Edwin and Alfred Kramer, Carlstadt, are the incorporators.

The Common Sense Mfg. Co., Newark, has been incorporated with a capital of $250,000 to manufacture shock absorbers, and allied products. William C. Paul, Anthony Sauer and Frederick C. Fischer, Newark, are the incorporators.

The Ampere Supply Co., 216 Berlin Street, Newark, will build an addition to its foundry, about 35 x 190 ft., to cost $14,000.

The Foxon Graphite Co., Hague, N. Y., is preparing plans for a new plant to be erected at an estimated cost of $300,000.

The Standard Mirror Co., Buffalo, 1168 Seneca Street, W. L. Hodney, president, has completed plans for the erection of a two-story brick and steel factory, 200 x 400 ft., at Milton Street and the Pennsylvania Railroad.

The Russell Motor Co., Toronto, Ont., has purchased the former plant of the Cyphers Incubator Co., Dewey Avenue and the New York Central Railroad Belt Line, Buffalo, which it will equip for the manufacture of time fuses and munition parts. A new company is being organized to take over and operate the plant.

Catalogs Wanted

Catalogs, particularly of machinery, are wanted at the Sandy Hook Proving Grounds, Fort Hancock, N. J. They should be addressed to the commanding officer, care of the purchasing department.

New England

BOSTON, Oct. 22.

As a result of the tremendous purchases directly and indirectly by manufacturers everywhere, the machine tool manufacturers of New England are flooded with orders and deliveries are being pushed months ahead, as was the case when the Allies first began the big munition output. Locally, the Fore River Shipbuilding Corporation, Quincy, Mass., the Watertown Arsenal, Watertown, Mass., and the Osgood-Bradley Co., Worcester, Mass., have been placing large orders, mostly for the heavier kinds of machinery. The last named company is to engage in the manufacture of gun mounts, in addition to its present output of passenger coaches and trolley cars. It is expected that immediately following the orders for the heavy machinery will come some large lists of smaller machine tools for tool rooms, etc. It is reported that the big list issued sometime ago by the General Electric Co. for its West Lynn, Mass., plant has not been closed, but the company has been in the market during the week for some minor equipment.

One item of the Watertown Arsenal purchases was a list of about 19 large planers. The price on planers has been advanced by virtually all the makers, advances differing in degree but reaching a total of between 20 and 25 per cent on deliveries eight months or more distant. It is understood that the two largest makers of big planers are sold up for well over a year ahead and that the New England planer builders will soon be in a similar condition, if the present demand long continues. One New England maker has quoted an advance of 10 per cent on planers for January and February delivery; 15 per cent for March and April delivery, and 20 per cent for May and June delivery. These advances are thus announced as a protection against expected advancing costs, particularly of labor.

One of the biggest deals of the past few days has been the taking over of the Bridgeport Projectile Co., Bridgeport, Conn., by the Liberty Ordnance Co., which has just been incorporated with a capital stock of $4,000,000, as noted last week. This plant was originally formed at the outbreak of

the war in Europe, as reported at that time by German interests, and in April, 1915, received an order from the German Government for 2,000,000 shrapnel cases at a cost of $5,000,000, of which amount $2,000,000 is said to have been advanced by Carl Heynan, reported to be a special representative of the German Emperor. The contract was cancelled when delivery became impossible, and Heynan ended his connection with the company when the United States entered the war. The present capacity of the plant is 30,000 3-in. shells, 5000 4.7-in. shells, and 3000 6-in. shells per day. The company has just completed a new gun plant which has a capacity for 300 complete 5-in. navy guns per annum. Kenneth W. McNeil, president Liberty Ordnance Co., has announced that the new company has unreservedly placed itself at the disposition of the War and Navy departments.

The Marlin-Rockwell Corporation, New Haven, Conn., has begun work on three additional buildings, including a machine shop, 112 x 112 ft.; heating plant, 47 x 57 ft., and barracks, 50 x 60 ft.

The American Steel & Wire Co., Worcester, Mass., is building a one-story factory, 90 x 128 ft., at its South Works.

Peter A. Frasse & Co., Inc., Hartford, Conn., has awarded a contract for a one-story addition to its steel plant at 47 Boulevard.

The Stanley Works, New Britain, Conn., has taken out permits to build three small structures on North Burritt Street: 12 x 17 ft, 20 x 100 ft., and 34 x 60 ft., respectively.

Landers, Frary & Clark, New Britain, Conn., are planning an addition which it is expected will cost about $35,000.

The Rockwood Sprinkler Co., Worcester, Mass., is building a two-story annealing house and carpenter shop, 52 x 80 ft.

The Barnum Forge Co., Stratford, Conn., has been incorporated with authorized capital stock of $4,500. The incorporators are Charles J. Hermansen, Sam Smegelsky and Gottfried Hockert, all of Bridgeport.

The General Electric Co., Lynn, Mass., has started the construction of an addition, 60 x 160 ft., one story, to its River Works.

The B. F. Sturtevant Co., Boston, has tentative plans for an addition to its factory at Readville, Mass.

The Blake & Knowles Works of the Worthington Pump & Machinery Corporation, Cambridge, Mass., is building an addition, 65 x 120 ft., four stories, and has awarded a contract for a one-story foundry extension, 80 x 120 ft., to be built at once. The company is busy on a contract for pumps for torpedo boat destroyers.

The Springfield Aircraft Corporation, Springfield, Mass., is building an addition to its plant to cost about $50,000.

The United States Bobbin & Shuttle Co., Eddy Street, Providence, R. I., has commenced the construction of a new one-story plant at Barton, Vt., to cost about $25,000.

Potter & Johnston, Newport Avenue, Pawtucket, R. I., manufacturers of automatic machines, are building a new two-story machine shop, about 85 x 290 ft., to cost $60,000.

W. S. Randall, Portland, Me., and associates have recently incorporated in Delaware the McKee Safety Appliance Corporation, with capital of $1,500,000, to manufacture safety devices and special machinery.

The Hardman Railroad Tie Corporation, Fall River, Mass., has been incorporated in Delaware with a capital of $1,000,000, to manufacture railroad ties. George E. Hardman, Frank S. Brunage, William H. Brown and Alvin G. Weeks, Fall River, and Ernest Haynes, Pawtucket, R. I.; Robert A. Smith, Newport, R. I., and Joseph Mercer, Providence, R. I., are the incorporators.

Philadelphia

PHILADELPHIA, Oct. 23.

Considerable buying activity is now noted in the Philadelphia machinery market in connection with the requirements of shipbuilders and for airplane work.

The American International Shipbuilding Corporation, now located in its new offices at 142 North Broad Street, Philadelphia, is going ahead rapidly with the construction of its ship assembling plant at Hog Island. Several contracts are said to have been completed for the fabrication of standardized steel sections. It is the plan of the corporation to let contracts for about 95 per cent of all the fabricated steel used in the ships, the remaining 5 per cent to be done on the ground. For construction work and the handling of material on the ground, nearly 30 locomotive cranes have been purchased from the Industrial Works, Bay City, Mich.

The William Cramp & Sons Ship & Engine Building Co. and the New York Shipbuilding Corporation are making plans for work on torpedo boat destroyers. The Cramp shipyard has issued a small list of new machine tools, but it is understood will buy more, while the New York Shipbuilding Corporation will place orders shortly on a large list to be issued this week.

A large number of machine tools have been purchased by the Hess-Bright Mfg. Co., Philadelphia, which will manufacture a considerable part of the ball bearings to be used in airplane engines. The Carlson & Wenstrom Co. will build a new plant, having obtained a contract for ball bearings from the J. G. White Engineering Corporation, which, it is now understood, will engage in the production of airplane engines. The Carlson & Wenstrom Co. has bought a number of grinding machines and is in the market for automatics and other equipment. The Wright Roller Bearing Co. has purchased the old Lubin motion picture plant at Nineteenth Street and Indiana Avenue, Philadelphia, and will move its entire equipment from Spring City, Pa., within 60 days. This company has also received contracts for ball bearings and is buying new machine tools, one substantial order having been placed last week.

The Simplex Automobile Co., New Brunswick, N. J., is reported to have finally obtained its Government contract for airplane engines. An order has been received by one company for several grinding machines, but a large number of machine tools are yet to be purchased.

The H. T. Shearer Machine Co., Waynesboro, Pa., has issued a list of about 20 tools and has purchased eight grinding machines for use on a contract for crank shafts obtained from the Ford Motor Co., Detroit. The Espen Lucas Machine Works, Philadelphia, has been buying a few tools for work on machinery for torpedo boat destroyers.

The Frankford Arsenal is placing orders for equipment for its new fuse factory, orders for automatics placed last week aggregating about $35,000.

The Pennsylvania Railroad Co. has bought 10 24-in. lathes for locomotive repair work in France.

The Bartlett & Hayward Co., Baltimore, is placing orders for tools. The Worthington Pump & Machinery Corporation is reported to have closed its contract with the Government for shell work and will buy additional tools on a list issued some weeks ago. The Jeanesville plant, where the work is to be done, will turn out 20,000 shells a day.

The Norfolk & Western Railroad has bought two 20-ton locomotive cranes and the Cramp shipyard has bought one locomotive crane.

The Frankford Taxi Co., Philadelphia, has been incorporated in Delaware with capital of $10,000 to manufacture automobile supplies. Harry A. and E. S. Beddow and George Schlafer, Philadelphia, are the incorporators.

The Ford Chain Block & Mfg. Co., Philadelphia, manufacturer of chain blocks and metal products, will erect an addition to its machine shop at Diamond and Palethorp streets.

C. Trevor Dunham, Inc., Philadelphia, has been incorporated in Delaware, with capital of $50,000 to manufacture automobiles. Herbert L. and E. P. Maris, Philadelphia, are the incorporators.

The S. S. White Dental Mfg. Co., Twelfth and Chestnut streets, Philadelphia, manufacturer of scientific and professional instruments, is having plans prepared for extensions and improvements.

The Luzerne Rubber Co., Muirhead Avenue, Trenton, N. J., has filed plans for the erection of a one-story, brick and steel addition.

Albrecht Pagensticker, Jr., Trenton, N. J., has awarded a contract for the erection of a new one-story machine shop, about 53 x 85 ft., at 520 Brunswick Avenue, to cost about $7,000.

The Bay Ridge Specialty Co., Trenton, N. J., manufacturer of bathroom fixtures, has acquired the plant of the Royal Rubber Co., Stokes Avenue, which it will equip for manufacturing. A one-story building will also be erected. J. O. Hunt, 114 North Montgomery Street, Trenton, is architect.

The Empire Tire & Rubber Co., North Clinton Avenue, Trenton, will erect a one-story, brick and steel addition to cost about $40,000.

The Naceskid Service Chain Co., Trenton, N. J., has been incorporated with a capital of $100,000, to manufacture anti-skid chains. Frank Nace, John G. Hann and Thomas T. Woodhouse, Trenton, are the incorporators.

The Zee Zee Tire & Rubber Co., Yardville, near Trenton, N. J., manufacturer of automobile tires, tubes, etc., is having plans prepared for a two-story, reinforced-concrete addition, about 40 x 120 ft., to cost $20,000.

The Yardville Rubber Specialty Co., Trenton, has been incorporated with a capital of $10,000 to manufacture rubber goods. Solomon Berman, S. J. Lewis and Harry Johnson are the incorporators.

The South Jersey Foundry Co., Camden, has been incorporated with a capital of $250,000 to manufacture cast-iron pipe and kindred specialties. K. L. Praisen, Herbert J. Koehler and J. F. Sutton are the incorporators.

The Baldwin Locomotive Works, Philadelphia, has received a contract from the Government for 600 gasoline locomotives, dinkey type, to be used for trench service in France, aggregating about $4,500,000.

The Wridgway Co., Scranton, Pa., manufacturer of pistons for airplane motors, has acquired property at Hazleton, for its proposed new works, adjoining the Lehigh Valley Railroad, near the plant of the Hazleton Separator Co. It is proposed to construct an initial plant consisting of two two-story buildings, about 60 x 150 ft. and 36 x 80 ft. respectively. The plant will be ready for operation at the earliest possible date.

The Pressed Steel Co., North and Penn streets, Wilkes-Barre, Pa., has awarded a contract for the erection of a one-story addition, about 57 x 80 ft., to cost in the neighborhood of $15,000.

The Badenhouse Boiler Co., Cornwall, Pa., has awarded a contract for the construction of a new one-story plant, 200 x 225 ft., to cost about $75,000. It is also considering the erection of a smaller, three-story building.

The Minersville Tube Mill, Minersville, Pa., has been organized to manufacture pipes and tubing. A site at the town limits has been acquired for a plant and contract awarded to the W. H. Gaylord Construction Co., Scranton. It is said that the initial works will give employment to about 150.

The Cochrane Brass Foundry Co., East Wallace and Sherman streets, York, Pa., manufacturer of brass and bronze products, has awarded a contract for the erection of an addition to its plant. It has received a contract from the Government for castings for gun mounts, machine guns and submarine boats. A. M. Hake & Co., York, are the contractors.

The Safety Machine Co., Reading, Pa., manufacturer of safety devices, with plant at Topton, Pa., and assembling works at Reading, is planning for the establishment of new works at Reading to consolidate all branches of operation. It is said that the proposed new plant, site for which is now being selected, will cost about $200,000. Meyer Axelrod is president.

The Lycoming Foundry & Machine Co., Oliver and High streets, Williamsport, Pa., manufacturer of gas and gasoline engines, has acquired five acres adjoining its plant and is said to be contemplating the erection of additions.

S. L. Allen & Co., Philadelphia, reported as taking bids for an addition to their plant, state that they are simply getting bids on work necessary to strengthen the floors in one of their present buildings.

Baltimore

BALTIMORE, Oct. 22.

The American Propeller & Mfg. Co., 233 to 249 East Hamburg Street, Baltimore, has awarded a contract for a two-story brick addition, 150 x 200 ft., at Jackson and Gittings streets, to cost about $5,000.

The Poole Engineering & Machine Co., Woodberry, Md., will build a one-story fireproof gun factory, 154 x 504 ft., to cost $338,000. The contract has been awarded to the H. D. Watts Co., Garrett Building, Baltimore.

The Chesapeake Iron Works, Westport, Md., plans to erect an additional shop, 49 x 250 ft.

The Pusey & Jones Co., Wilmington, Del., will make improvements totalling about $130,000, which include a foundry to cost $70,000, pattern store room to cost $50,000 and an addition to the pattern shop to cost $10,000.

The W. G. Krussman Co., Wilmington, Del., has been incorporated with a capital of $10,000, to manufacture automobile parts and supplies. Edward G. Cook and W. G. Krussman, Wilmington, are the incorporators.

The Waitt Wrench Co., Wilmington, Del., has been incorporated with a capital of $100,000 to manufacture wrenches and tools. George G. Stiegler and E. E. Wright, Wilmington, are the incorporators.

The Mays Accounting Machine Co., Asheville, N. C., has been incorporated with a capital of $600,000, to manufacture adding machines. M. V. Moore, Baxter Shemwell and Philip R. Moale are the incorporators.

The Newport News Shipbuilding & Drydock Co., Newport News, Va., is said to be planning for additions to its foundry, machine shop, marine ways and other structures.

Chicago

CHICAGO, Oct. 22.

Inquiries from companies having Government contracts are appearing steadily, and it is apparent that the Government is looking more than formerly to the Northern Central States for munitions and equipment for the production of machine tools. An inquiry has come from central Illinois for about $100,000 worth of tools for munitions manufacture, the details of which are withheld. A firm in northern Michigan wants tools for gun-mount work, and wants them quickly. A similar inquiry emanates from Minneapolis.

The Hart-Parr Co., Charles City, Iowa, is inquiring in this market for 30 large lathes for making 9.2-in. shells. The company suffered a serious loss by fire Oct. 9, the forge shop and one of the shell shops being damaged to the extent of about $200,000. The shops had been idle several months, since the completion of a British shell order, but negotiations were under way to start the machinery on a domestic shell order. Several large lathes and grinding machines were destroyed, and it is presumably for the replacement of these that the present inquiry is out. A large forging press for forming shells, an important part of the company's equipment, was but slightly damaged by the fire.

The Rock Island Arsenal is buying steadily, and private munitions makers continue in the market for tools required to balance their equipment, one of these being the Root & Van Dervoort Engine Co., East Moline, Ill. Inquiry continues active for heavy tools, and the great majority can be traced to Government work. A sprinkling of industrial buying is noted, but the smaller jobbing shops are doing very little purchasing. There is almost an oversupply of small lathes. As a rule, dealers' stocks are complete, except for large machines, due to forethought in ordering months ago.

It is recognized everywhere that the Government must be liberal in allowing exemptions from military duty where it is justified for industrial reasons. A step in securing such exemptions is believed to lie in the action of the Council of National Defense in a recent request to manufacturers for lists of their orders which spring from war contracts.

The J. K. Stewart Mfg. Co., manufacturer of metal parts for automobiles, 327 Wells Street, Chicago, has let the contract for a one and two-story mill construction factory, 299 x 300 ft., at 4535 to 4561 West Fullerton Avenue, to cost $150,000.

Plans are being prepared by J. C. Llewellyn, architect, 38 South Dearborn Street, Chicago, for a three-story factory, 100 x 125 ft., at 110-116 South Jefferson Street, for the Rumely-Wachs Machinery Co. It will be of mill construction, and cost about $60,000. No definite date has been set for beginning the work.

The International Harvester Co., 606 South Michigan Avenue, Chicago, will erect a six-story factory, 63 x 248.8 ft. and 33 x 42.4 ft., at its tractor works, 2600 West Thirty-first Street, to cost $175,000.

The Gas & Electric Motor Bus Corporation, Chicago, has leased from the Chicago Surface Lines a one-story machine shop at Racine and Belden Avenues, which will be used as a repair plant and factory for making parts.

The Edwards Cylinder Mfg. Co., Pekin, Ill., has been incorporated, with a capital stock of $10,000, to manufacture pump cylinders and well and pump supplies. The incorporators are Charles R. Edwards, D. H. Learned, and N. H. Lee.

The Decker Machine & Tractor Co., Chicago, has been incorporated in Delaware with capital of $200,000 to manufacture tractors and allied machinery. John A. Decker, J. G. Burns and Harry Lewis, all of Chicago, are the incorporators.

Milwaukee

MILWAUKEE, Oct. 22.

The principal feature of the week in the local machine-tool industry has been the stream of orders for milling machines coming from shops holding Government contracts. The demand for these tools has been exceptionally heavy during recent weeks, but in the last few days became particularly brisk. Business in other tools is maintained at a high rate, with no slackening in demand, and shops find it wholly impossible to make any headway in catching up on deliveries.

Metal-working shops continue to make additions whenever it is possible to obtain building materials, labor and

the equipment. In the case of contractors executing orders of especial urgency for the Government, it is not difficult to provide for extensions and equipment, but shops with no priority claim do not fare so well.

The Waukesha Motor Co., Waukesha, Wis., which has an order for 2500 Liberty motors for the new class B military truck, 15,000 of which will be built for the Government, has been obliged to increase its facilities about 50 per cent to handle the additional business. Work has been started on an addition 100 x 225 ft. to shop No. 1, and an addition 90 x 180 ft, to shop No. 2. both to be ready by Dec. 1. From 200 to 300 additional workmen will be required. Harry L. Horning is vice-president and general manager.

The Allis-Chalmers Mfg. Co., Milwaukee, expects to close contracts this week with the Emergency Fleet Corporation for furnishing marine turbines. The amount involved is said to be approximately $10,000,000.

The Ampco Shipbuilding Co., Security Building, Milwaukee, which is being organized by interests owning the Ampco Rolling Mills Corporation to establish a shipbuilding plant and a dry dock in Milwaukee, is not yet ready to make formal announcement of its plans. It is stated that the project is progressing.

The board of school directors, Milwaukee, has engaged Van Ryn & DeGelleke, architects, Caswell Block, to prepare plans for a new high school, with manual training department, at Lenox and Montana streets, Bay View, to cost about $600,000. Bids will be taken early in December. Frank M. Harbach is secretary and business manager.

The Packard Stoker Corporation of America, Milwaukee, has been organized with a capital stock of $25,000 to manufacture stokers and other mechanical devices for factories, shops, mills, etc. The incorporators are James A. Packard, Charles B. Nehring and John L. Stecker.

The core room of the Western Malleables Co., Beaver Dam. Wis., was damaged $3,500 by fire last week. Operations were not seriously interrupted, other core-room facilities being available.

The Crary Tool Co., 220 Becher Street, Milwaukee, has been succeeded by the Milwaukee Tool & Forge Co., which will enlarge the plant and install considerable new equipment.

Alfred C. Clas, architect, Colby-Abbot Building, is designing a four-story fireproof manufacturing building, 60 x 150 ft., of reinforced concrete and brick, costing about $50,000, for the Kletzsch Realty Co., Third and State streets, Milwaukee. Bids will be taken about Nov. 15.

The Auto Parts Mfg. Co., 313-317 Milwaukee Street, Milwaukee, sustained an estimated loss of $50,000 by fire, but repairs have been undertaken and operations will only be slightly interrupted. Walter H. Schwab is vice-president and general manager.

The Washington Cutlery Co., Watertown, Wis., is erecting a shop addition costing about $15,000 and contemplates a new heating and power plant which will cost about $10,000.

The Seeger Mfg. Co., Milwaukee, which established a plant some time ago at 1001 Thirtieth Street, for the manufacture of garage heaters using coal as fuel, has incorporated in Illinois, with a capital stock of $7,400. Headquarters are located at 175 West Jackson Boulevard, Chicago. F. G. Hudson is secretary.

The Northwestern Pattern Works, 258 Fourth Street, Milwaukee, owned by Rudolph Mueller, has been incorporated in Illinois, with an authorized capital stock of $2,500.

The Ajax Forge Co., Chicago, has been incorporated in Delaware, with an authorized capital stock of $1,750,000, to take over the drop forge plant now being completed at Superior, Wis. It is said to be closely affiliated with the Ajax Frog & Switch Co., Blue Island, Ill. The company has also been granted a charter in Wisconsin. William E. Crocombe is secretary.

Tomahawk, Wis., has engaged R. W. Richardson, St. Paul, Minn., consulting engineer, to prepare specifications for improvements to the municipal waterworks costing about $20,000, which will include a new pumping station, 20 x 25 ft., and an electrically driven centrifugal pump with a capacity of 300 gal. per min.

The New Way Machinery Co., Eau Claire, Wis., organized recently with $60,000 capital to manufacture a 5-purpose combination motor truck, tractor, concrete mixer, etc., will also build a 4-wheel-drive truck designed by Jonas Bergh, Eau Claire, who will be superintendent of the machine shop. The new plant is rapidly being equipped and is expected to be in full operation by Nov. 1.

The M. & S. Electric Co., Milwaukee, owned by A. C. Mantel and O. E. Stark, has opened a machine shop at 1209 Layton Boulevard and will do a general line of repair work on gas engines, electrical equipment, storage batteries, etc.

Detroit

DETROIT, Oct. 22.

The machine-tool market continues unusually active. The largest orders placed were by the American Car & Foundry Co., but many small orders have also been received. Deliveries on standard machines are very slow. Indications are that the lack of coal in this district, which has handicapped manufacturers to a considerable extent, will be overcome within two weeks. The Government has promised to ship coal to any industry facing a shut-down. Labor is well employed at high wages. A war order amounting to $6,000,000 has been offered to local metal-stamping firms which are now bidding for the contract.

The Campbell Mfg. & Foundry Co., Muskegon, Mich., is rushing completion on two additions to its plant which is manufacturing radiator castings for Army trucks. It is completing one addition, and another building is under construction.

The Grand Trunk Railway will open its new shops at Port Huron, Mich., Dec. 1. Most of the lighter machinery will be installed by Nov. 1, but the heavy machinery has not been received. The cost of the work will be in the neighborhood of $1,000,000.

The Advance Brass Mfg. Co., Muskegon, Mich., has been organized by Oscar Berg, Wallach Foote and Felig St. Louis, and will locate in the building formerly occupied by the Racine Boat Mfg. Co. Alex. G. Wilson, Chicago, a brass foundry expert, will be general manager.

The J. T. Wilson Co., Detroit, announces that it will place a new 5-ton truck on the market the first of the year.

The Olympian Motors Co., Pontiac, Mich., has purchased the equipment of the Meridian Mfg. Co., Indianapolis, Ind., and will build bodies for its own automobiles.

The Auto Body Co., Lansing, Mich., is making changes in its machine department.

The Parker Mfg. Co., Detroit, manufacturer of drill chucks, has purchased the plant of the Star Motor Co., Ann Arbor, where it will remove. Gorhman C. Parker, Detroit, is president. The company is to be reorganized and incorporated for $150,000.

The Flottorp Mfg. Co., Chicago, has shipped its machinery to Grand Rapids, Mich., where it will remove. Aircraft propellers will be manufactured.

The Brunner Mond Co., a subsidiary of the Solvay Process Co., Detroit, is building a plant near Amherstburg, Ont., at a cost of $8,000,000. A contract has been let for the extension of the Essex Terminal Railroad to the new plant.

The Standard Screw Products Co., Detroit, has increased its capital from $250,000 to $750,000.

The H. Mueller Mfg. Co., Ltd., Decatur, Ill., will build a factory at Port Huron, Mich., costing $200,000, for the manufacture of brass plumbing fixtures. Excavation has begun for a sand-blast foundry and plans are in progress for other buildings.

Cleveland

CLEVELAND, Oct. 22.

The most interesting feature of the week was an improvement in scattered inquiry for small lots of machines, which has [illegible] supplemented the demand for round lots of tools. A new inquiry, however, has come from an Ohio manufacturer for 25 machine tools. The demand is greatest for heavy drilling, planing and boring machines. While the call is largely for machinery for Government work, particularly for motor trucks, orders are being received from manufacturers having other contracts. An active demand is noted for automatic machinery in lots of one to two or three machines, and a local manufacturer reports a heavier volume of business for these machines this month than during the previous two or three months.

The White Co., Cleveland, is having plans prepared by the Watson Engineering Co., for a service station in Philadelphia to cost $175,000. It will cover a site 215 x 270 ft., and be provided with a boiler house, blacksmith shop, etc.

The National Acme Co., Cleveland, will erect a new two-story factory, 50 x 112 ft., in connection with its present plant on Stanton Avenue. George S. Rider & Co., Cleveland, are the engineers.

The Interstate Foundry Co., Cleveland, has placed a contract for the erection of an addition, to cost about $12,000, for a finishing and shipping department.

The Humphrey Pipe & Foundry Co., Bellefontaine, Ohio, has been purchased by J. L. Simpson, Lima, Ohio, and will be operated by an incorporated company, of which Mr. Simpson is president.

A controlling interest in the Cambridge Machine Co.,

Cambridge, Ohio, has been sold to H. E. Loomis and associates connected with the National Coal Co., that city. It is stated that the plant will be enlarged and new equipment added. Mine cars and locomotives and brass, iron and semi-steel castings will be manufactured.

Cincinnati

CINCINNATI, Oct. 22.

Machine tool lists are more plentiful, with the larger sized machines in demand. There is a call for sensitive drilling machines, however, and makers are very busy. In addition to the machine tools previously bought by J. G. White & Co., New York, the trade has been notified that another large list is pending, the machines to be installed in a large aeroplane factory to be constructed for the Government in Massachusetts. The Standard Ordnance Co., New York, has not yet purchased the machine tools wanted for a munitions plant to be established in Hamilton, Ohio. It is reported, but not officially confirmed, that the Mosler Safe Co., Hamilton, is interested in this project.

The steady ordering of machine tools, portable electric drilling machines and other equipment for shipment to Spain is taken as an indication that manufacturing industries in that country are receiving more attention than heretofore.

The Post Glover Electric Co., Cincinnati, dealer in electrical machinery and supplies, has leased a building on West Third Street. Its former plant on West Fourth Street was recently destroyed by fire.

The Ohio Knife Co., Cincinnati, has engaged B. L. Baldwin & Co., to prepare plans for an addition to its plant in Northside.

The Armstrong-Sinclair Co., Cincinnati, has been incorporated with $5,000 capital stock by George D. Armstrong, L. L. Sinclair and others to manufacture oxy-acetylene equipment.

The J. E. Breese Co., Cincinnati, manufacturer of roofing and building specialties, has let contract for a one-story, brick factory, 40 x 200 ft., on Reading Road.

The John C. Turner Novelty Co., Dayton, Ohio, has increased its capital stock from $55,000 to $100,000 and has let contract for an addition to its toy factory.

The Dayton Display Fixture & Novelty Co., Dayton, will build an addition to its plant at 712 East Monument Avenue.

The Wapakoneta Mfg. Co., Wapakoneta, Ohio, recently incorporated with $50,000 capital stock by Frank Andrews and others, is erecting a plant for the manufacture of fire extinguishers and automobile specialties.

The Ohio Mfg. Co., Xenia, Ohio, is installing a plant for the manufacture of jewelers' hack saws.

The Milnor Electric Co., Cincinnati, has been organized by L. T. Milnor, John Nolloth and W. D. Jackson. An office and warehouse has been opened at 124 East Fourth Street, where a full line of electrical supplies will be carried. Later the company expects to add a number of specialties and catalogs are solicited.

The Central South

LOUISVILLE, Oct. 22.

Machine shops and foundries continue busy. With machine tools in good demand and deliveries slow, shops in position to handle repair work find plenty to do. Inquiries for boilers are numerous, and delivery in reasonable time is usually the condition of an order. No relief from a shortage of coal and coke is in immediate prospect. Labor is scarce.

The Roy C. Whayne Supply Co., Louisville, is in the market for a three-drum hoisting engine, 10 x 12 in.

The E. Z. Comfort Chair Co., Louisville, has been incorporated by George B. Chase, T. Wallace Denhard and Howard B. Haehle, with an authorized capital of $20,000, to establish a plant to manufacture chairs.

Covington, Ky., will receive bids until Nov. 30 for the construction and operation of an electric light and power house. L. L. Applegate is city recorder.

The branch plant of the American Car & Foundry Co., Jeffersonville, Ind., has been enlarged and additional equipment installed at a cost of $100,000.

The Southern Welding & Reclaiming Co., Birmingham, Ala., has recently been organized to operate a local foundry. F. R. Campbell, F. S. Johnson and E. H. Ross, head the company.

The Louisville & Nashville Railroad, Louisville, will soon commence the construction of a new roundhouse and shop at Paris, Tenn., to cost about $60,000.

Indianapolis

INDIANAPOLIS, Oct. 22.

The Steele Mfg. Co., Indianapolis, has been incorporated with $50,000 capital stock, to manufacture machinery and electrical devices for automobiles. The directors are Ben Steele, Gottfried D. Yeager and Frank Fertig.

The Pittsburgh Model Engine Co., Peru, Ind., has a contract amounting to $750,000 from the Baldwin Locomotive Works for engines for locomotives to be used by the American forces in France.

The Sterlite Specialty Co., Auburn, Ind., has been incorporated, with $100,000 capital stock, to manufacture metal specialties. The directors are Arthur A. Lehman, John A. Fletcher, Wayne H. Smitley, William H. Heider and Herman L. C. Thiel.

The Superior Tire Co., Anderson, Ind., capitalized at $750,000, has bought a 10-acre site on which it will erect a factory. O. Hibner, Canton, Ohio, is president; W. I. O'Bryan, Cleveland, vice-president; and W. W. Campbell, Toledo, Ohio, is secretary.

St. Louis

ST. LOUIS, Oct. 22.

The Shamrock Custom Gin Co., Shamrock, Okla., has been incorporated with $60,000 capital by M. H. Newman, K. Farha and G. C. Townsend, and will equip a cotton gin.

Jonesville, La., will equip a municipal electric light and power plant. The mayor is in charge.

The Oil Casing Closing Machine Co., Wirt, Okla., has been organized with a capital of $22,000 for the manufacture of oil well machinery.

The Ashcroft-Hampton Mfg. Co., Fordyce, Ark., has been incorporated with a capital stock of $40,000 by Joseph Ashcroft, G. M. Hampton and others, and will equip an ice-making and cold-storage plant.

The Pan American Pipe Line Co., Tulsa, Okla., has been incorporated with a capital stock of $100,000 by J. M. Burk, C. F. Hopkins and William Sack and will equip a pipe line and oil-pumping stations. It is affiliated with the Pan American Refining Co., Tulsa.

L. O. Crosby and others have bought a lumber plant at Picayune, La., and will add a mill with a daily capacity of 300,000 ft.

The Interstate Metal Works, Laurel, Miss., has been incorporated by C. F. Tarbutton and others and has plans for a metal-working plant, the equipment to cost about $15,000.

The State Normal School, Warrensburg, Mo., will equip a boiler house and power plant requiring about $15,000 worth of machinery.

The Burke Motor Economy Co., Clinton, Okla., has been incorporated with a capital stock of $100,000, to manufacture attachments for gasoline-engine carburetors. W. T. Burke is president and A. J. Welch treasurer.

Ardmore, Okla., W. R. Roberts, mayor, will expend about $250,000 on additional waterworks plant equipment, etc.

The plant of the East Point Gin Co., East Point, La., has been burned with a loss of $21,000 on machinery, which will be replaced.

C. A. Roberson, Cannon Ball Motor Co., Texico, N. M., is reported in the market for foundry equipment, electrical machinery, heating and ventilating apparatus, air-washing machinery, power-house equipment and machinery for manufacturing automobiles, trucks and tractors.

The Midland Machine Works, Muskogee, Okla., is moving into a new factory, 75 x 102 ft.

V. C. and J. E. Scott, Mobile, Ala., are making rapid progress in the construction of a new shipbuilding plant at Shellbank, near Mobile. A shop, 50 x 100 ft., with one shipway, has been completed and other structures will provide for increased operations, in building wooden vessels.

The Turner Terminal Co., Mobile, is planning for the erection of shipbuilding works on the Mobile River. Horace Turner is president.

The St. Louis Screw Co., Clarence Avenue, St. Louis, will build a one-story addition, about 60 x 104 ft.

H. T. Hornsby, for 14 years vice-president and general manager of the United Iron Works Co., Springfield, Mo., and who recently resigned, has purchased the controlling interest of the Central Foundry Co., Webb City, Mo., manufacturer of hard iron and cupola steel castings. J. A. Desbonne, formerly manager of the United Iron Works Co. at Pittsburg, Kan., is associated with the company.

Texas

AUSTIN, Oct. 20.

The demand for small tools is heavier than for several months. The machinery trade in Mexico is constantly growing, and dealers in this section are receiving many orders.

The Planters' Gin Co., Port Lavaca, will build a cotton gin to cost $10,000. W. F. Hollamon is a stockholder.

The Wichita Cotton Harvester Co., Wichita Falls, will build a plant to manufacture a special machine for harvesting cotton. J. A. Kemp is a stockholder.

N. L. Nelson, Sour Lake, will build a waterworks system and electric light plant at Goose Creek.

The Water Corporation of Texarkana will install machinery to supplement the existing pumping plant, the capacity of which will be increased.

California

SAN FRANCISCO, Oct. 16.

Local supply houses report some good orders for heavy tools from new shipyards and for extensions for old yards. Small tools do not command the same attention. Small lathes for garages have met with a ready sale lately, and a considerable amount of logging equipment is being supplied to lumber companies. Several orders for steam shovels have recently been placed, and the scarcity of labor is expected to lead to additional business. Dredges are in demand for Government irrigation projects.

The General Electric Co., Oakland, is erecting a three-story factory at Sixteenth and Campbell streets at a cost of $85,500, for manufacturing electric lamps.

The United Shipsmithing Co., San Francisco, has been incorporated with a capital stock of $5,000 by F. A. and M. D. Schaumleffel and A. M. Geisler.

The Universal Tool Co., Los Angeles, will erect a factory for the manufacture of an adjustable wrench.

A. Meister & Sons, Sacramento, wagon manufacturers, contemplate the erection of a factory for the manufacture of a combination automobile and railroad car.

The Globe Iron Works, Sacramento, will erect two additional one-story reinforced concrete buildings, each 50 x 300 ft.

The American Machine Works, Oakland, is erecting a factory and warehouse, 50 x 100 ft., to cost about $30,000.

H. B. Bush, Redlands, will install a plant for the manufacture of a patent hot wire cutter and other appliances.

W. G. Schell, Uplands, has bought the plant of the Uplands Foundry & Machine Co. and will equip it to manufacture orchard heaters and distillate burners.

With the commandeering by the Government of the Risdon Iron Works, embracing 30 acres of ground and eight shipbuilding slips directly south of the Potrero plant of the Union Iron Works, San Francisco, the latter company will have greatly increased facilities for constructing the 40 torpedo boat destroyers for which it recently received a contract from the Navy Department. The Risdon Iron Works property was bought in May, 1911, by the United States Steel Corporation and has been used since by the United States Steel Products Co. as a supply and shipping point for its export trade. Machine shops, fabricating shops and other buildings will be erected at once and the slips will rapidly be put into condition to handle two destroyer frames each, which means that 16 destroyers can be built at the Risdon plant at one time.

The Pacific Northwest

SEATTLE, WASH., Oct. 16.

The plant of the Clyde Casting Co., Alki Avenue and West Hinds Street, Seattle, was recently damaged by fire, with a loss of $5,000. The pattern shop was saved.

The Aurora Foundry Co., Seattle, has completed the installation of machinery in its new foundry, which is 70 x 100 ft. It is equipped with an electric steel furnace, and has a capacity of 2000 lb. of steel castings per day. Gray iron castings will also be manufactured.

The Coeur d'Alene Foundry & Hardware Co., Wallace, Idaho, has increased its capital stock from $500,000 to $1,000,000.

The Cooley Mfg. Co., Seattle, contemplates the erection of a brass foundry at 1722 Twenty-second Avenue South. The initial plant will be small, with provision for enlargement later.

The Wallace Foundry Co., Ltd., North Vancouver, B. C., has been incorporated for $75,000. It is understood a foundry will be built.

The Salem Iron Works, Salem, Ore., which recently sold its equipment to a Seattle shipbuilding company, will install new equipment in its plant on Front Street.

Walter J. Lunn, Auburn, Wash., will immediately rebuild his sawmill recently destroyed by fire. The new plant will have a daily capacity of 35,000 ft.

The Markey Machinery Company, Seattle, has completed the installation of machinery in its new plant, at a cost of $40,000. The shop will turn out marine machinery, specializing in ship fittings.

The Motorship Construction Co., Vancouver, Wash., is building a 75 x 150-ft. addition to its plant. The company has a contract for more than 300 lifeboats and liferafts.

King Brothers, Portland, boiler manufacturers, will build an addition, 40 x 60 ft., to their plant.

Canada

TORONTO, Oct. 22.

The Dominion Battery Co., Ltd., Montreal, has been incorporated with a capital stock of $200,000 by Eldon Moir, John Campbell, Donald L. McDonald, and others, to manufacture dry batteries, flash lights, lamps, electrical goods, machinery, etc.

The Canada Scale & Slicer Co., Ltd., Toronto, has been incorporated with a capital stock of $150,000 by Charles E. Strowger, Arthur E. Watts, Joseph L. Howard and others, all of Brantford, Ont., to manufacture weighing machines, scales, meat slicers, etc.

The Canuck Automobiles, Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Mervil Macdonald, Traders Bank Building, Edwin Smily, Bruce Williams and others, to manufacture automobiles, motor cars, engines, tools, etc.

The Fairbairn Truck Mfg. Co., Ltd., Toronto, has been incorporated with a capital stock of $40,000 by Gordon A. Fairbairn, Ernest A. Hall, William Parsons, and others, to manufacture motor trucks, motors, engines, automobile accessories, etc.

The Magnet Toy & Novelty Co., Ltd., Port Hope, Ont., has been incorporated with a capital stock of $100,000, by Arthur R. Hoskin, James Macdonald, Daniel W. Markham, 27 Dundonald Avenue, and others, all of Toronto, to manufacture furniture, wood-turnings, toys, machinery, etc. A building has been secured at Port Hope and manufacturing will commence at an early date.

The Tavistock Milling Co., Tavistock, Ont., is in the market for a 25 or 30-hp. boiler for heating purposes.

The plant of the Mountain District Brick & Tile Co. Nanaimo, B. C., was recently totally destroyed by fire with a loss of $25,000. It is expected that the plant will be rebuilt and new machinery purchased.

T. Hobbs, Mail and Empire, King and Bay streets, Toronto, is in the market for an 8 x 8-in. air compressor, 100 lb. pressure.

George McMillan & Co., Sarnia, Ont., is in the market for a second-hand Kotten or Dallett granite junior surfacer.

T. H. Ellis, Mount Forest, Ont., is in the market for a 5-hp., 60-cycle, 220 or 550-volt, single-phase motor.

The Canada Steamship Lines, Ltd., 9 Victoria Square, Montreal, is contemplating the erection of a shipyard at Cap de Madeleine, Que. J. W. Norcross is president.

The Dominion Stamping Co., Walkerville, Ont., has awarded contracts for the erection of a forge shop to cost $16,000. It is in the market for machinery, including drop-hammers, etc.

Work will be started in the near future on the construction of a dam and power house at St. Narcisse, Que., for the Shawinigan Water & Power Co., Shawinigan Falls, Que., to cost $400,000. R. Lindsay, Shawinigan Falls, is engineer.

The planing mill owned by the Peterboro Lumber Co., 163 Hunter Street, Peterboro, Ont., was totally destroyed by fire, with a loss of $30,000.

The Davidson, Smith Co., Grain Exchange Building, Fort William, Ont., is in the market for motors, belting, shafting and general elevator equipment for its new elevator.

The saw and shingle mill at Langley, B. C., owned by W. E. Laking, was destroyed by fire, with a loss of $30,000.

The Ricardo Gramaphone Co., Montreal, has been incorporated with a capital stock of $20,000 by R. Lefebvre, G. Dutand, A. Clermont and others to manufacture talking machines, phonographs, etc.

The Albany Pump Co., 16 Pearl Street, Toronto, is in the market for No. 2 screw machines, with geared head.